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Pulping Cornstalks

Cornstalks Products Co. Develops Paper Pulp at New Illinois Plant

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Staff Representative

IT IS a long way from the days of T'sai Lun, the Chinese scholar, who, in or about 105 A.D., invented paper. His researches showed that a material suitable for writing purposes could be prepared from the bark of the paper mulberry tree. Although the process employed in the production of the finished paper in those early days was crude when compared with the various processes of today, it opened up a vast field for speculation and research.

Through the centuries, those interested in the research phase of the paper industry have given much thought and have spent much time in studying various raw materials as offering suitable fiber for paper making purposes. Cotton and linen rags proved themselves to be a most satisfactory raw material for paper production during the early centuries of paper making. To this day, high grade rags constitute, according to opinions of many, the best kind of raw material for the production of high quality products such as bonds and ledgers.

With an increase in consumption of paper, arose the necessity of additional effort to locate a material that could be obtained in abundance and yet economically. The industry had grown out of a hand-made process operation into a process involving the use of power driven machinery.

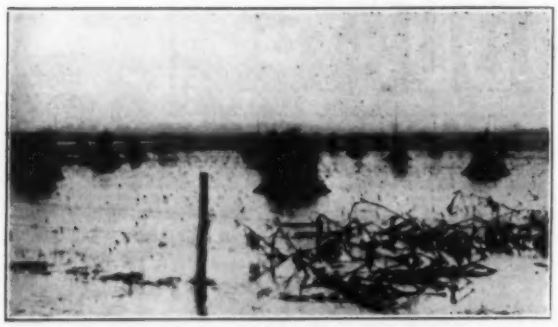
In 1800, Matthias Koops published a book upon paper which he had been able to manufacture from straw and wood. One paragraph in the appendix of the book reads "The following lines are printed upon paper made from wood alone, the produce of this country (England), without any intermixture of rags, waste paper, barks, straw, or other vegetable substance, from which paper might be, or has hitherto been manufactured; and of this the most ample testimony can be given, if necessary". However, it was left for other investigators to patent and develop the various woodpulp processes of our present day industry.

In all of these researches, it was easy to locate skeptics. Even as late as 1874, after three of the four commonly used processes of today had been invented, an English journal stated that "great endeavors had been made to introduce woodpulp as a fiber, but practical paper makers deem it a failure". With such skepticism, however, the industry has grown through the last fifty years until the annual consumption of pulp wood in the United States now is approximately 8,000,000 cords.

Another raw material that received consideration at the hands of the early investigators, was cornstalks. It is said that Jacob Schaeffer proposed the use of cornstalks as far back as 1765. Until now no success has been attained in a commercial way in utilizing agricultural wastes as papermaking material.

Today, with past experience rather discouraging, finds another group of investigators and operators braving the statements of skeptics, and with science and ample capital at its disposal is tackling the utilization of cornstalks for paper making fiber in a most unusual way. In September, 1927, the organization behind the present Cornstalk Products Co., purchased an abandoned automobile factory and some car shops immediately adjacent at Tilton, Vermillion County, Illinois, a suburb of Danville, Ill. A large chemical laboratory and a pilot plant of one-ton daily capacity were designed, equipped and put into operation in the buildings available. The pilot plant was designed to use a process for the pulping of cornstalks which had been developed by Dr. Bela Dorner, a Hungarian chemist. With the experience

obtained in the pilot mill and laboratory over approximately the period of a year, sufficient data were developed to assure those immediately interested of the commercial possibilities in the project.



Winter scene showing stalks in shocks

The pilot plant has been discontinued and a plant of 40 to 50 tons daily capacity is near completion.

Husker, shredder, and baler operations in farm yard

Part of that capacity is now in daily production. The laboratory staff is constantly at work on fundamental problems of importance to the success of the enterprise.

Planting, Harvesting and Transportation

One of the most unusual experiments involved the planting of 1,000 acres to corn. Corn on this large area has been grown this season under practically every condition as to planting, cultivation, and fertilization. The purpose of such an investigation is to determine what variety of corn will be most suitable for the farmer and pulp manufacturer. The corn desired is that which will yield not only the greatest number of bushels of corn per acre, but also the greatest yield of fiber from the stalk in the pulping operation.

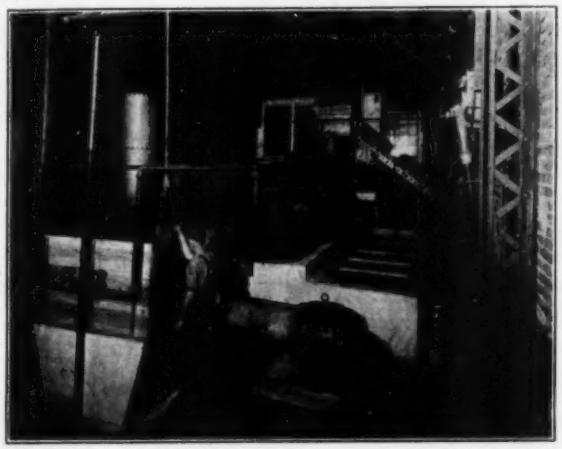
Several truck loads of stalks on way to plant storage

Much time and energy have likewise been spent in studying various means of harvesting the corn crop. Tractors and horses have been used to haul corn harvesters of a type common to all farmers and costs of harvesting determined. These investigations have brought to light many important facts relative to the costs of various methods of harvesting and have demonstrated that cornstalks can be

General view of Cornstalk Products Company, Inc., showing neat storage pile of stalks

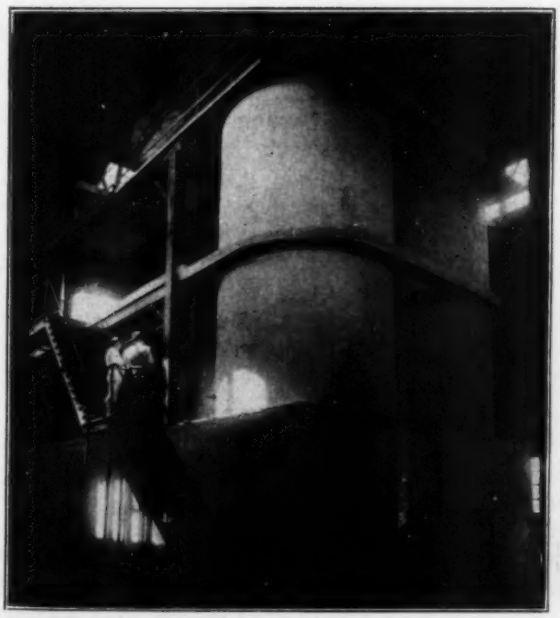
harvested and assembled with present equipment as an economical raw material.

During the first season's operation, approximately 10,000 tons of stalks were delivered to the plant at Tilton. The stalks had all been baled before stacking at the plant. The average air-dry weight of a bale is approximately 100 pounds of shredded or 60 pounds of whole stalks. This vast quantity of raw material was for the most part delivered at the mill by truck and trailer. With hard surfaced roads it was possible to haul an average load of nine



View of crushing and washing equipment installation. Right rear—Inclined conveyor to crusher. Center—Stalk washer with water filter immediately to right. Left foreground—Second crusher installation for final crushing of stalks before pulping

tons of baled stalks on one truck and trailer. With the problem of harvesting the crop well in hand and with good roads available, it may be appreciated how easily baled cornstalks may be put in storage at the mill.



View of bleaching equipment installation

While the harvesting and transportation problems were being studied, the investigative work on the

Interior of pulp mill. Left foreground—Liquor storage tank. To the right—Pressure vessel for preliminary treatment of stalks, digesters and diffuser

pulping of the stalk continued. This work had progressed sufficiently, as mentioned previously, to permit the dismantling of the pilot mill before the commercial plant was brought into full scale production. Expansion to 100 tons a day at Danville and construction of 100-ton units in other corn belt locations are planned.

Equipment and Process

The original thought behind the project was to produce a high alpha pulp suitable for rayon. Modifications of the process, however, have shown that a pulp well suited to the requirements of the paper industry can be produced at unexpectedly low cost. Therefore, for the present, at least, the development will continue along the lines of paper pulp manufacture rather than pulp for rayon.

The major equipment of the pulp mill at the present time consists of two Jeffrey crushers, a specially designed washer, preliminary treating pressure vessel for stalks, two vertical digesters, diffuser, dia-

View of pulp drying machine from dry end

phragm screen installation, bleaching system, thickeners, 48-inch cylinder pulp dryer installation, liquor storage, and special equipment for defiberizing and hydrating. Other equipment used in the pilot mill is also available for use should it be deemed advisable.

In process, the baled cornstalks delivered at the mill and from which the baling wires have been removed are elevated on an inclined conveyor to a point where they are delivered to a Jeffrey crusher or bale breaker. This crusher partially reduces the stalks and from the crusher the material passes to an ingenious cylindrical worm washer. The washer installation is designed to permit a re-use of much of the water and functions simply as a means of freeing the partially reduced stalks from field dirt and other undesirable materials which might adhere to the stalks and could be freed by washing. From the washer, the stalks drop by gravity into a Jeffrey hammer type crusher which more finely divides them. This series of operations compares with wood preparation in a chemical pulp mill. The raw material must be sufficiently reduced in size to permit easy chemical treatment as well as to be free from all adhering dirt.

The finely divided material is then given a preliminary treatment of short duration in a pressure vessel from which it is pumped into one of the two digesters. In the digesters, the material is chemically treated with an alkaline liquor under pressures lower than commonly employed for pulping wood and over a shorter time interval. The treatment which the material receives in the preliminary pressure vessel and in the digester determines very largely the ease with which the washing operation may be performed, the yield of pulp, the quality of pulp, etc.

Steel storage tanks for the liquor are conveniently located within the plant so that the liquor may be easily supplied to the digesters. Additional facilities for by-product recovery are also being considered.

The digesters are of the welded type equipped with false bottoms and fittings similar for the most part to a soda or sulphate digester. Special features about the installation permit the stalks to be pulped by a very unusual method of heating and circulation. As soon as the cooking operation is complete, the first washing operation of the pulp stock takes place within the digester. From the digester, the partially washed stock is pumped to a diffuser in which the final washing operation is accomplished. The washed pulp may then be handled in any one of several ways depending upon the final results desired. The stock may be bleached at this point or it may be defiberized before bleaching.

The bleaching installation has been designed to handle the entire production of the plant with good margin of safety. It consists of two large units of the Wolf-Fletcher type and is an excellent example of good concrete construction.

If the stock has not been completely defiberized before bleaching, it may be defiberized at this point in the operation, that is, after the bleaching operation, including washing, has been entirely completed. It is understood that the bleaching requirements of the stock are much less than for wood pulp and that the final yield of pulp is sufficiently high to permit production at a satisfactory cost figure.

The defiberizing equipment installation including piping layout is of a special nature, but is designed to function over rather wide limits depending upon the nature of final product desired.

The pulp may be thickened after the defiberizing operation or after bleaching, depending on the sequence in the performance of these operations upon standard pulp thickening equipment. A 48-inch cylinder pulp drying machine used for some of the pilot mill investigations is retained in the commercial plant so that pulp is easily formed, dried, and prepared in roll form for shipment. Other thickening equipment to meet the requirements of the plant is contemplated.

Acreage and Production

Based on dry weight of raw material, according to one of the officials of the company, a mill producing 100 tons of finished pulp per day and operating 300 days a year would require about 75,000 tons of cornstalks if the pulp were for use in paper production—that is, 40 per cent yield. A conservative estimate places the yield of stalks at about 1.5 tons per acre. In other words, a 100 ton mill over the period of an operating year would require the stalks from 50,000 to 75,000 acres depending upon the quality of pulp produced.

The plant at Danville has been largely erected under the personal supervision of E. F. Hulbert, chief engineer. The plant laboratory is under direction of Dr. E. R. Darling, formerly of James Milliken University, Decatur, Ill. Another laboratory is maintained in New York City in charge of Dr. John E. Jackson, a research chemist specializing upon cellulose chemical industries. Harvey J. Sconce, an Illinois farmer and authority on corn breeding, is in charge of raw material production. The general manager of the enterprise is Frank K. Gardner of New York, who was responsible for bringing the process of Dr. Dorner to this country.

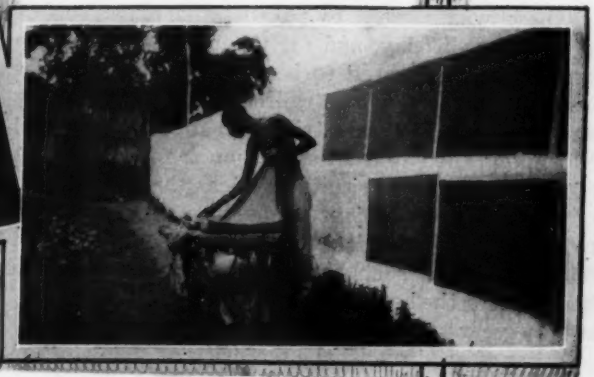
Is Safety hung on the hook with the overalls when the day's work is done; or does the spirit of Safety continue to manifest itself abroad and in the home for the guidance of self and loved ones? There is perfect safety in perfect obedience to the right custom or practice in doing things. Every accident occurs through disobedience to such right activity somehow.

Making Paper in China

Coolie gathering rags and paper from the streets and houses of Peking. These he sells to the paper manufacturer

Rags, scraps and other waste paper brought to a Peking paper mill

Mixing vat for scrap paper at Peking paper mill



After being thoroughly mixed the pulp is poured into large tanks. The laborers dip frames covered with a thin mesh into the pulp, then lift the frame, let the water drain, and turn the thin layer on a pile of previously made sheets. These are taken to a drying wall with a south frontage.

With the aid of a brush the Chinese coolie in a paper factory in Peking plasters the damp paper sheets on the south drying wall of the factory.

Chinese coolie folding newly made paper as he takes it from south drying wall of a Peking paper factory.

Current Thought by William Sibley

"Master of Emergencies"

UP TO and including the administration of Theodore Roosevelt, the growth and development of this country was, in largest measure, predicated upon the advance of agriculture. True, the reconstruction period following the Civil War ushered in an era of commercial expansion theretofore unparalleled. During the Eighties and Nineties there was tremendous activity in railroads, lumber, packing, and a few other industries, but the progress of any or all of these was merely to parallel the expansion of agriculture. Today, and for the past ten or fifteen years, this has ceased to be. Our economic tables have turned, and while railroads, lumber, packing and other pioneer industries are still growing and expanding, their present expansion is for the benefit of commerce, not agriculture. Less than 5 per cent of all railroad extensions made since 1915 have been to open up new agricultural territory. More than 95 per cent of such rail transportation extension has been for the benefit of industry. During the past twenty years we have built hundreds of thousands of miles of good roads, the majority of that mileage being out into the country. But they have been primarily for the benefit of industry and commerce —only secondarily for the farmer.

Today, the United States stands a nation quite different and apart from the United States of Andrew Jackson, Andrew Johnson or William McKinley. Ours is an industial nation; not an agricultural nation. The larger portion of our population is urban, not rural. We, as a nation, are industrialists; not agrarian. It augurs well, therefore, for the continued growth and development of our nation that, for the first time in history, a capable industrial engineer has been nominated for the place of President. The chief concern of the United States of yesterday was the establishment of and adherence to the Constitution. Considerations legislative and legal heretofore have taken precedence over commercial industrial. For that reason we have had need for the professional politician, the so-thought "stateman", as President. Today, and tomorrow, the chief concern of the United States will be the protection and development of future commerce. Industrial considerations are paramount now; and they will continue so to be for as long as our vision extends. For that reason we have need to replace the old professional politician and have for our Presidents thoroughly capable business men and engineers.

To capably administer the executive control of the United States, from now henceforward, we need men who, through a lifetime of experience have been active in formulating far-reaching policies, organizing wide-spread connections and in coping with wary, crafty, or brow-beating wire-pullers. His previous dealings must have made him a keen judge of humankind, provided him with the ability to accurately evaluate circumstances and conditions, developed within him an analytical mind that will permit him to gauge exactly what and where real ability is, and given him a determination that allows for prompt and positive execution. He must know, thoroughly and completely, all phases of commerce and industry; must possess a sympathetic understanding for agricultural; must be internationally minded. Because of the recent, complete reversal of our economic tables, no other type of man can qualify as President.

For the first time in all history we have the opportunity of electing such a man to the Presidency. His name is Herbert Hoover.

If anything, Mr. Hoover's experience is a broader gauge than the necessary qualifications set down above. For the first eleven years of his life he was a farmer's boy. He knows what it means to bed down the horses, milk the cows on a cold and icy morning, teach the obstreperous calf to drink from a pail, and pitch hay in the broiling sun. He received early training for business by opening silver-mines in Burma and re-organizing copper mines in Russia. He learned something of human nature from dealing with Chinese officials inflamed with the Boxer rebellion, enduring the superior airs of the English owners of Australian mines, combating selfish and malicious politicians, in Washington, and coping with the necessity crazed officials of Belgium.

Mr. Hoover's diverse commercial experience has given him a complete well-rounded knowledge of how companies are formed; how and why they initiate policies; what mistakes they make; what sort of officials succeed and how; how waste comes about and where to stop it, how enterprises losing money can be made to pay profits; how initiative and imagination are often hampered by officiousness or timidity; how a man good at one thing might be a total failure at another; how and why a novice may do better at an unaccustomed job than a veteran steeped in over-specialization; and how to organize, establish and maintain both commercial and political organizations. He is all that Will Rogers said of him when the famous humorist styled Mr. Hoover the "Master of Emergencies".

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Herbert Clark Hoover

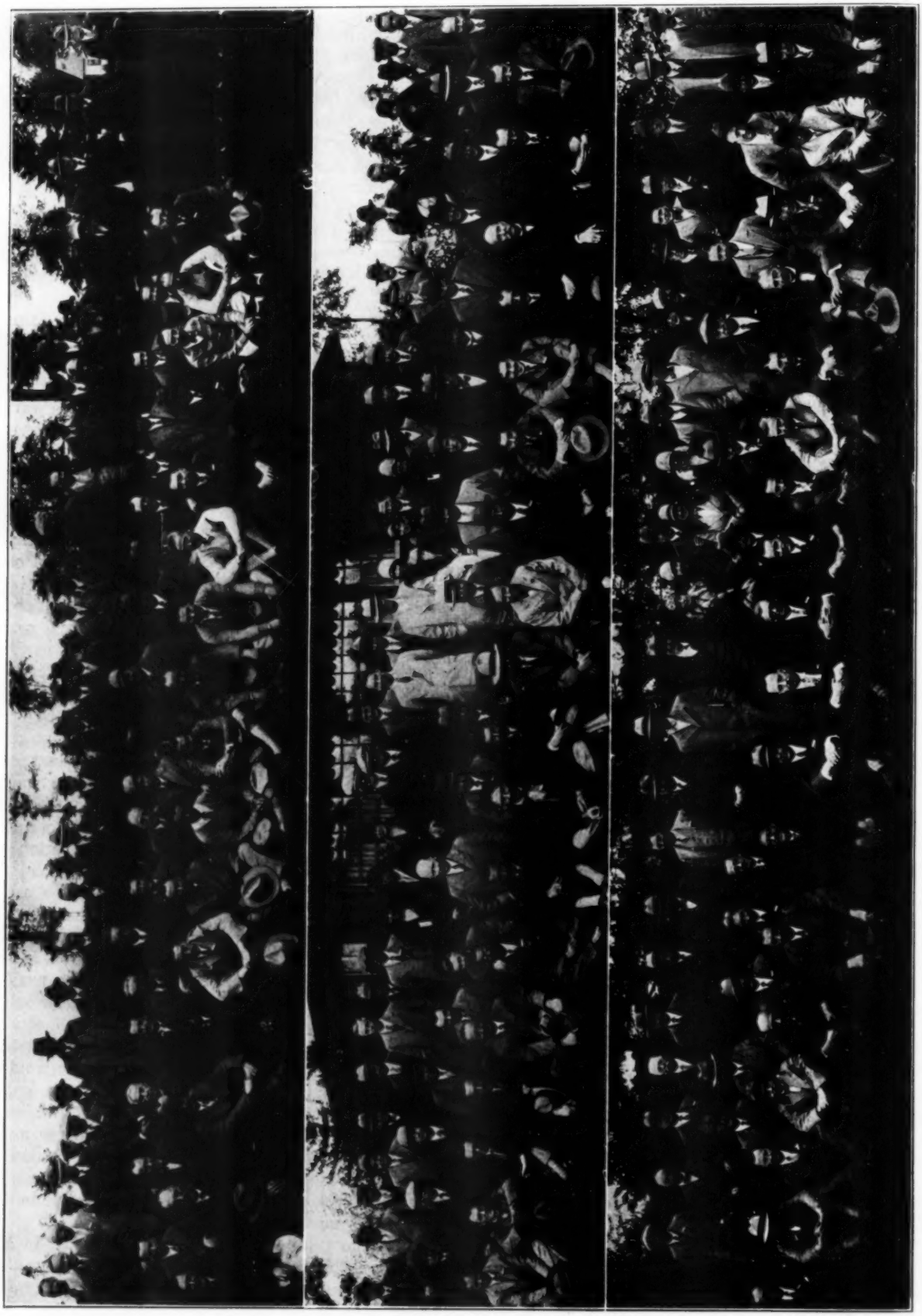
A typical example of the worth of having a "Master of Emergencies" for President is well told by Mr. Ford in his recent interview with Samuel Crowther published in the Saturday Evening Post. Mr. Ford said:

"From time to time foreign nations have been foolish enough to imagine that by some system of control they could raise the prices to us of raw materials that we had to have and which they imagined they alone could supply. Some of the controls were official and others were semi- official. The British control of rubber was undertaken from the best of motives, but the temptation to boost the price was too strong and so rubber went above a dollar a pound. Secretary Hoover did not ask for legislation or make any protest, he knowing that any nation has the right to charge us what it pleases. It is up to us to defend ourselves. He called a meeting of the rubber men. They learned just how much rubber was already in the country and what could be done toward reclaiming rubber. That action broke the artificial price and saved the users of automobiles alone at least half a billion dollars. Incidentally, it caused some of us to take a start toward getting our own sources of rubber. A man versed in the ways of the word and of business would have made a great many speeches and probably had the country talking war—and accomplished nothing but the generation of a great deal of hard feeling." . . . "This man Hoover not only has ideals but he can do things. He knows what to do and where to find the right men." Thus Henry Ford subscribes to Will Roger's statement that Mr. Hoover is a "Master of Emergencies".

Because of our recent outstanding industrial progress, there is a belief among many that this country has arrived—that we have fully developed. Nothing could be farther from the truth. We have already gone farther than any other nation on earth, but that certainty is faint praise. The industrial progress we will make during the next eight or ten years will dwarf into insignificance whatever progress we have made up to the present time. During the next four or eight years, wise administration will be needed on such commercial and industrial things as flood control, agricultural surplus, hydro-power development, internal waterways, radio and television, aviation, highway extension, reforestation, industrial merger movement, and countless others.

Mr. Hoover's vast commercial experience assures this nation of that needed wise and practical administration, in the event he is elected President. Furthermore, to the presidency Mr. Hoover would bring an intimate personal knowledge of all countries, their governments and leaders, together with a mighty prestige among those abroad. He would bring this in a measure no other living man possesses. He would bring to the presidency an unrivalled understanding of American commerce and industry and of all the economic forces which underlie our prosperity and advancement. This ability he has in such measure as no other single individual can approach.

This is no time to hand the executive control of the United States to the professional politician. We need, for our President, a business man, an industrialist, an engineer.



Panoramic picture of fall meeting of the Technical Association of the Pulp and Paper Industry, Wausau, Wis., September 25, 26 and 27, 1928

Fall Meeting of T.A.P.P.I.

Symposiums Replete with Valuable Papers in Three Day Session at Wausau, Wisconsin

MEMBERS of T.A.P.P.I., from near and far, assembled to the call of the association for the fall meeting on September 25 to 27, 1928 inclusive, at Wausau, Wisconsin.

Wausau is a delightful city of about 20,000 people located in one of the beautiful sections of Wisconsin in a country which only a comparatively few years ago was heavily timbered. It was around the development of the lumber industry that Wausau grew. Today the pulp and paper industry is an important business of the region. In the vicinity of Wausau are located a number of well-known pulp and paper mills including the Marathon Paper Mills Co., Rothschild; Mosinee Paper Mills Co., Mosinee; Wausau Paper Mills Co., Brokaw; Tomahawk Kraft Paper Co., Tomahawk; Tomahawk Pulp & Paper Co., Tomahawk; Whiting-Plover Paper Co., Stevens Point; Stevens Point Pulp and Paper Co., Stevens Point; Consolidated Water Power and Paper Co., Wisconsin Rapids; and the Nekoosa-Edwards Paper Co., Inc., Port Edwards.

The association is to be complimented on its choice of Wausau as its convention city for the fall meeting, and appreciation should be expressed to the local committee who so admirably took charge of the entire program. Allen Abrams of Marathon Paper Mills, as general chairman, together with all of his co-workers were in a large way responsible for the pleasant and helpful time had by all those who were privileged to attend.

FIRST DAY'S SESSION

Registration began at 8 A. M. on the morning of September 25 at the Elks Club. The general session covering reports of standing committees began sharply at 10 A. M. with R. G. Macdonald, secretary of the association, presiding.

Mr. Macdonald, in his opening remarks, mentioned the suitability of Wausau for holding the convention, as well as the effort that had been put forth by the local committee in preparation for the meeting. He complimented the work of the local committee and then called on Mr. Abrams for a few remarks.

Mr. Abrams welcomed all of the guests and members of T.A.P.P.I. to the convention. He also stated that the meetings would be held on schedule and co-operation of all would be appreciated. It might be said at this point that the meetings continuing over the three day period progressed smoothly and on schedule as previously outlined.

Committee Reports

Fine and Special Papers—After Mr. Abrams' few remarks, Mr. Macdonald proceeded with the reading of committee reports. The first committee report to be presented was that of the Fine and Special Paper Committee. Dr. T. C. Bentzen, chief chemist of the Whiting-Plover Paper Company, as chairman of this committee, spoke briefly of the plans of the committee. He mentioned the preparation of a paper by Ivan Lundbeck, chief chemist of the Lee Paper Company on the subject of Safety Papers, as well as the preparation of a paper on "Processing of Coated Papers and Equipment Used," by F. W. Egan of John Waldron Corp. He also mentioned that he was preparing a paper for presentation at the spring meeting on the subject of producing photographic papers in this country in competition with imported papers. Dr. Bentzen mentioned an inquiry on a suitable method for determination of fading qualities of paper, use of fadeometer for testing, and the recording of results in such a test.

Heat, Light and Power—Following Dr. Bentzen's report, Mr. Macdonald read the report of John F. Rhoades, chairman of the Heat, Light, and Power Committee. In his report Mr. Rhoades mentioned the papers which had been prepared for presentation at the meeting at Wausau. Dr. H. L. Joachim, Chairman of a new committee on "Corrosion and Waste Problems," then told of the work before his committee. He mentioned such subjects as "Stock Losses," "Corrosion of Tubes in Evaporators," and "Corrosion of Piping." He stated that several papers along the line of Corrosion and Waste Problems would be presented during the convention. One point stressed by Dr. Joachim was the amount of time required on the part of various members of the committee to develop some of the investigations. He requested that the industry, therefore, give support to these investigations.

Abstracts and Bibliography—The next report was on "Abstracts and Bibliography." It was not possible for Dr. Clarence J. West, Chairman, to be present. The report was, therefore, read by Mr. Macdonald. Dr. West, in his report, mentioned progress on the work of bibliography of papermaking literature and the bibliography of papermaking materials. It is expected that the bibliography of papermaking literature will be ready for distribution at the next annual meeting.

Paper Testing—Mr. B. W. Scribner followed the reading of Dr. West's report with his report on Paper Testing. He told of some of the work on determination of gloss and opacity, discussed use of glarimeter, and mentioned the total number of completed paper testing methods. A proposed method of bulk testing for paper was mentioned as being considered by the committee. A meeting of the Paper Testing Committee was stated to have been held on June 14, 1928, at the Bureau of Standards in Washington. In concluding his remarks, Mr. Scribner called attention to the sectional paper testing meeting at the annual convention.

Mr. Macdonald, following Mr. Scribner's report, read the report of H. A. Rothchild on "Physical Standards for Pulp." Mr. Rothchild briefly outlined the present work of the committee.

Vocational Training—The report of the Committee on Training was presented by Mr. Abrams, Chairman. He stated that during the past year the country had been divided into co-operative areas. Mills in these areas took students for practical experience during the summer vacation period. During the past summer, 125 to 150 men were placed in various mills which co-operated with the committee in this work. It was recommended by the committee that the work be placed in the hands of a paid secretary. Mr. Abrams also mentioned in his report the meeting of combined educational committee comprising representatives of the American Paper and Pulp Association, American Paper and Pulp Mill's Superintendent's Association, and the Technical Association of the Pulp and Paper Industry. This meeting was held at the Wausau Club, Wausau, Wis., on Monday, September 24, the day preceding the beginning of the fall meeting of the association.

Mechanical Pulp and Sulphate Pulp—The Mechanical Pulp Committee report was read by Mr. Macdonald. The report was followed by the report of the Sulphate Pulp Committee, of which C. K. Textor is chairman. In Mr. Textor's report was stated that the work of the committee is a continuation of the work of last year. Among the subjects being considered are papermaking qualities of pulp, stock losses, and methods of washing pulp.

Board Mill's Co-operation Sought—Following the reading of Mr. Textor's report, C. C. Heritage, in charge—Section of Pulp and Paper, United States Forest Products Laboratory and chairman of the newly formed Paperboard Committee, a sub-committee of the felt committee, stated that a tentative program of activities had been planned. Likewise, a questionnaire was in process of construction and was nearly ready for mailing to all of the board mills of the country.

He asked for the co-operation of the board industry with the paperboard committee and thus to make the work of the committee productive of best results. The report of this committee concluded the committee reports and the meeting proceeded immediately to the presentation of the first paper.

Paper from Cornstalks

Edward F. Hulbert, Chief Engineer, Cornstalks Products Company, Danville, Illinois, was introduced by Mr. Macdonald to speak on "Paper from Cornstalks." In the early part of his paper he mentioned briefly that in their operations the complete growth of the corn plant with the exception of the cobs and the corn itself was utilized. The stalk, pith, leaves, and node fibers, all find their way into the digester for pulping.

Mr. Hulbert mentioned the early experiences in the development of the present project, the erection of laboratory, pilot mill, and the gathering and recovery of stalks. He likewise, stated that the present organization had undertaken a program of corn growing and testing which had involved the planting of approximately 1000 acres to various varieties of corn planted under practically every conceivable system. Systematic research had received its shart in the program, since upon the results of this work future work depends.

In concluding his remarks, Mr. Hulbert stated that the accomplishments of the company during the few months of its existence show: that cornstalk waste can be successfully gathered and delivered to the pulp mill at a price that makes its commercial use, as a possible substitute for wood pulps, an attractive venture; that it is possible to produce a clean, high bleached, white pulp, suitable for the papermaker in the production of many grades of finished white papers, at a price below that of chemical woodpulps; that the yield of finished pulp will be from 35 to 45 per cent of the dry weight of the stalk; that a sufficient quantity of raw material to operate a 100-ton daily capacity plant can be reproduced from year to year within a ten-mile radius of that operation; that the character of the finished pulp can be more or less controlled by proper control of the raw material in growing and gathering; that the pulp reacts very quickly to certain handling in the plant process, and complete hydration can be accomplished almost instantaneously, and almost as quickly it can be dehydrated and a free soft pulp obtained; and that it is possible to reproduce any quality found in the finished product of wood pulp with 100 per cent corn pulp.

The presentation of Mr. Hulbert's paper brought forth a number of questions and a discussion. The use of corn for ensilage, the area required for a 100-ton mill, and the use of similar refining apparatus for handling sulphate pulp were a few of the questions put to Mr. Hulbert. Mr. MacNaughton stressed the economic study of the problem, and mentioned a process which had been investigated a number of years ago. In this process was involved the separation of the pith cells from the fibers.

Following the presentation and discussion of Mr. Hulbert's paper the meeting adjourned for the morning, and after a most appetizing luncheon at Hotel Wausau, reconvened for the afternoon session at the Elks Club.

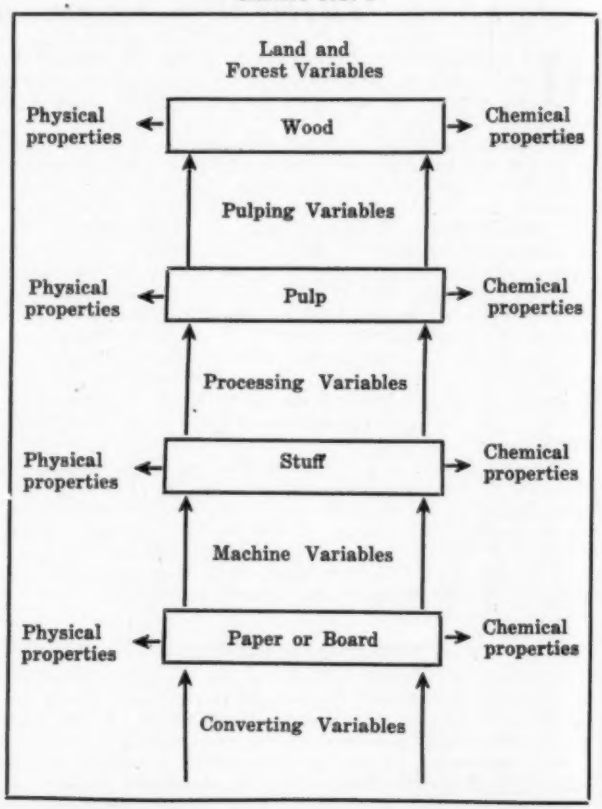
Forest Products Laboratory Symposium

The afternoon session of the first day was given over to a Forest Products Laboratory symposium which was conducted by C. C. Heritage, in charge of Pulp and Paper Section at the Laboratory.

Mr. Heritage first introduced C. P. Winslow, director of the Forest Products Laboratory. Mr. Winslow spoke on the work of the laboratory in relation to the pulp and paper industry. He mentioned that the technical organization of the laboratory, an integral part of the Forest Service of the Department of Agriculture, deals essentially with those research and development problems encountered in improving and increasing the utility of forest products. The technical staff at the laboratory consists of approximately 75 people who are working in a number of different fields. About eleven technical members of the laboratory are employed by the pulp and paper section. In concluding his remarks, Mr. Winslow mentioned the difficulty encountered in selecting problems for investigation and mentioned that one-fourth or more of the energy of the laboratory was expended in a study of problems pertaining to the pulp and paper industry.

C. C. Heritage, following the remarks of Mr. Winslow, presented to the association the method employed by the laboratory staff in studying various problems pertaining to the industry. He displayed the two charts which are reproduced herewith, one entitled "Use Requirements of Consumed Products" and the second "Major Objectives of the Pulp and Paper Section of the United States Forest Products Laboratory." A study of the first chart gave the scope and inter-relation of the fields of technical work in pulp and

CHART NO. 1



USE REQUIREMENTS OF CONSUMED PRODUCTS

Scope and Interrelation of the Fields of Technical Work in Pulp and Paper

CHART NO. 2

Major Objectives of the Pulp and Paper Section of the U. S. Forest Products Laboratory

1—Fundamental work
- (A) Improved methods for evaluating:
  - (a) Paper products relative to their use
  - (b) Pulps and stuffs relative to paper products
  - (c) Pulp woods relative to pulps
  - (d) Lands and forests relative to pulp wood
- (B) Increased knowledge of the effects of:
  - (a) Machine variables
  - (b) Fiber-processing variables
  - (c) Pulping variables
  - (d) Land and forest variables

2—Applied work

Improved and increased utilization of:
- (A) Particular species
- (B) Pulp wood at the mill
- (C) Waste

paper making; whereas a study of the second chart emphasized the fundamental objective as considered by the laboratory. Naturally, the program of work at the laboratory is governed in its details by expediency factors. In concluding his remarks, Mr. Heritage stated that the latch string of the laboratory was always out to the members of the technical association, and that a personal invitation was extended to each one present at the convention to visit the laboratory at their convenience.

He then stated that the papers of the symposium were arranged on the program in the same order as the objectives —fundamental studies being placed first, and that the papers were chosen as typical of the various fields of work of the pulp and paper section of the laboratory. With these remarks, he introduced R. H. Doughty, who presented his paper on "The Opacity Determination Using the Ives Tint Photometer."

Although a number of the papers presented during the afternoon session were the result of co-operative work by the staff at the laboratory, the following brief outline includes the list of papers and the individuals by whom presented.

"The Opacity Determination Using the Ives Tint Photometer"—R. H. Doughty.

"The Microstructure of a Wood Pulp Fiber"—G. J. Ritter.

"Methods Used at the Forest Products Laboratory for the Chemical Analysis of Pulps and Pulp Woods"—M. W. Bray.

"The Increased Utilization of Hardwoods for Pulp and Paper"—C. E. Curran.

"The Semi-sulphite Process"—W. H. Monsson.

"Recent Experiments in the Utilization of Mill Waste by Semi-Chemical Pulping"—C. E. Curran.

"The Bleaching of Wood Pulp—The effect of bleach ratio in bleaching sulphite pulp; and the effect of agitation on the color, reaction rate and chemical composition in bleaching sulphite pulp"—P. K. Baird.

"The Chemistry of the Alkaline Wood Pulp Processes—Effect of temperature on the rate of hydrolysis of spruce wood with sodium hydroxide"—M. W. Bray.

"Pulping Eastern Hemlock by the Sulphite Process—The effect of varying the time and temperature of impregnation"—W. H. Monsson.

This series of papers constituted the papers of the symposium which were presented during the session.

Opacity Determination

In Mr. Doughty's paper "Opacity Determination Using the Ives Tint Photometer", was emphasized the importance of opacity of a sheet of paper when considered from the standpoint of use requirements. Several recognized methods for measuring opacity were discussed. Likewise, the theory of the contrast ratio method (the contrast-ratio being the ratio of the brightness of two sheets—one of which is placed over an absorbing background, while the other is over a reflecting background) was developed in detail. The measurement of this contrast-ratio may be made, it was said, with any instrument that is capable of measuring or of comparing the apparent brightness of two samples under the condition of the test.

The use of the Ives tint photometer for contrast-ratio measurements was then described. Several factors which had been taken into account when evaluating readings made by this method were studied and discussed. Among the paper variables discussed were the effect of thickness and the effect of surface. Instrument variables including position of sample holders, and effect of color (both an instrument and a paper variable) were also discussed. Mr. Doughty mentioned that the necessity of correct adjustment of the photometer cannot be overemphasized, and stated that results checking within 1 per cent may be obtained, if reasonable precautions were taken throughout the work. Lantern slides were used throughout the presentation of the paper to illustrate results of the work.

The Microstructure of a Wood Pulp Fiber

Dr. G. J. Ritter at the conclusion of Mr. Doughty's remarks then presented his paper on "The Microstructure of a Wood Pulp Fiber". The work on this problem was done by Dr. Ritter in collaboration with G. H. Chidester. Lantern slides were used throughout the presentation of the paper to illustrate the actual structure of the fiber when studied under the microscope and when the fiber had been prepared in different ways or subjected to different treatments. The results of this investigation indicated that the cell wall of an individual fiber was constituted of several enveloping layers and that each of the layers in turn were made up of a number of smaller fiber-like constituents or fibrils.

Increased Utilization of Hardwoods

Dr. Ritter's paper was followed by the presentation of the paper "Increased Utilization of Hardwoods for Pulp and Paper" by C. E. Curran. Mr. Curran mentioned the production of newsprint from hardwood, and described the pulping of tawa wood for the New Zealand government and the conversion of this pulp to paper. The wood, according to Mr. Curran, was similar to maple in its physical characteristics. A mill scale demonstration was made at Ladysmith, Wis., in the plant of the Great Western Paper Company where this wood was converted into pulp. The pulp was then shipped to Wisconsin Rapids, Wis., where it was prepared into finished paper in the plant of the Consolidated Water Power and Paper Company. A portion of the paper which had been produced was shipped to New Zealand, while the remainder was used by one of the Madison, Wis., papers in a special issue. A copy of one of these Madison papers was displayed by Mr. Curran. Mr. Curran also mentioned the possibilities of utilizing various United States species of hardwoods in the production of various grades of paper. Continued study along this line was suggested by Mr. Heritage.

The Semi-Sulphite Process

The next paper on the program was on "The Semi-Sulphite Process." In this paper, Mr. Monsson told of the various investigations at the laboratory which resulted first in the development of the "semi-kraft" and later the "semi-chemical processes. The full text of this paper appears on another page of this issue.

The Bleaching of Wood Pulp

"The Bleaching of Wood Pulp" by P. K. Baird was the next paper on the program. The work covered by this paper was done jointly by Mr. Baird and Mr. Doughty.

In presenting his paper, Mr. Baird stated that it would be confined to the study of the effect of the bleach ratio on the color reaction rate, and chemical composition in bleaching sulphite pulp. In brief, Mr. Baird's remarks indicated with respect to the effect of variations of the bleach ratio on color that the higher the bleach ratio used the whiter and higher will be the final color by either the exhaustion or the excess chemical method; and that the higher color-removing efficiency will obtain in the exhaustion method. In respect to the effect of variations of bleach ratio on reaction rate it was observed that in all cases the chemical consumption was a function of the logarithm of the time up to 90 per cent consumption of the chemical, and that the rate of reaction was approximately proportionately higher for the bleach ratio.

In studying the effect of variations of bleach ratio on chemical composition it was concluded that the higher the bleach ratio used the greater the degradation of the cellu'ose; and that the best guides to proper bleaching of a pulp were the alpha-cellulose value, the alkali solubility, and the copper number with relative importance in the order given.

Chemistry of the Alkaline Wood Pulp Processes

"The Chemistry of the Alkaline Wood Pulp Processes" was the title of the next paper which was presented by Mr. Bray. Mr. Bray stated that the paper was the result of work done in studying the effect of temperature on the rate of delignification and hydrolysis of spruce wood with sodium hydroxide. Results obtained from the investigation showed that the temperature of digestion of the spruce wood with sodium hydroxide affected the velocity of the pulping reaction, that an increased temperature materially increased the rate of the reaction, and that with a raise of 10°C. ap-

proximately the same yield of a pulp with the same chemical properties were obtained in half of the cooking time

Pulping Eastern Hemlock by Sulphite Process

The last paper of the Forest Products Laboratory symposium to be presented during the afternoon session of the first day was "Pulping Eastern Hemlock by the Sulphite Process—The effect of varying the time and temperature of impregnation". This paper was presented by Mr. Monsson and Mr. Chidester. It was brought out that, although the consumption of eastern hemlock by sulphite mills in the Lake States region had increased during the past few years, no literature bearing on the question of optimum cooking conditions had been made available for the species. Both the effect of varying the time and temperature of the impregnation period were studied. Semi-commercial scale pulping experiments, in which either the time or the temperature of the penetration period was varied were made while other factors were held constant. The results of the investigation showed that the yields of pulp decreased with an increase in temperature during the penetration period, the amount of screening remaining practically constant. Likewise, with an increase in the time of the penetration period, the yields of pulp increased for temperature of 115°C, and 120°C, but failed to do so for 110°C. An increase in temperature of the penetration period was found to reduce the bleach requirement. The bursting strength factor was found to decrease as the temperature of the penetration period increased from 110°C to 115°C and 120°C at 1½ hours time, while it increased as the time of penetration increased for 115°C and 120°C.

After Mr. Monsson had completed the presentation of his paper, the meeting was opened for discussion. In this discussion a number of interesting questions were raised.

SECOND DAY'S SESSION

Symposium on Waste

The meeting on Wednesday morning, a symposium on waste, was opened by C. E. Tucker, President of T.A.P.P.I. Dr. H. L. Joachim of the Container Corporation of America, Philadelphia, Pa., was introduced as chairman. Dr. Joachim, changing the program as previously outlined, introduced T. H. Ireland, of Crane Company, who then presented his paper on "Application of Piping Materials in the Paper Industry".

Application of Piping Materials in Paper Industry

According to Mr. Ireland, a great deal of time and consideration are given in the selection of steam generators, prime movers, and other auxiliary equipment; yet for economical or other reasons the same consideration is not given to the design, selection and application of the piping material to make it safe and reliable for the operation of the entire installation of the factory or mill. He mentioned cases where the design of the piping installation was at fault, also cases in which poor workmanship was apparent, and others in which the installations were made with material that the manufacturer never intended for such service. He suggested where possible to avoid the use of specially designed fittings where conditions can be met with fittings that are regularly listed and manufactured for the service.

In the design of a piping system, Mr. Ireland suggested that reference be made to manufacturers information when selecting types and sizes of material. He emphasized particularly the use of manufacturer's data when selecting flanged fittings. Mr. Ireland exhibited a copy of Standard Specifications for Power Piping and stated that they could be obtained upon request.

Detailed information was presented on Talbot lined steel pipe. The lining consists of a molten bitumen that has been specially treated to give proper physical properties and mixed with a finely ground inert filler. This lining material is applied to the inside of the pipe by a centrifugal process.

Steam velocities, pitch of steam mains, metals and materials for piping, use and application of piping material, flange standards and pipe bends were only a few of the topics considered by Mr. Ireland. Steam receiver separators, steam traps, now-return valves were also discussed.

In concluding his remarks Mr. Ireland stressed the proper requisitioning and ordering of piping materials. Indefinite orders cause delay in shipment and often require that such orders be referred back to mill for further information.

Corrosion of Piping in Paper Mills

The second paper to be read on the second morning of the convention was on the subject of "Corrosion of Piping in Paper Mills". The paper was prepared by G. R. Wyman, of Bird and Sons. It was read in the absence of Mr. Wyman, by Philip DeWolf.

A definition of corrosion was first given. According to Mr. Wyman the economics of the problem must be considered. Interior and exterior corrosion of piping was discussed. Likewise, it was brought out in the paper that the use of white water tended to increase the acid concentration of the water, and that exterior pipe surfaces exposed to corrosive vapors from chemicals such as sulphur dioxide, chlorine, etc., should be supplied with a protective coating.

Mr. McCall of the Detroit Graphite Company, after the reading of Mr. Wyman's paper, gave further data on the subject of Corrosion, stating in concluding his remarks that he would be pleased to go into the subject carefully with anyone who made the request.

Control of Stock Losses in the Paper Mill

"Control of Stock Losses in the Paper Mill" by A. T. Gardner was the subject of the next paper. The full text of this paper appears on another page of this issue.

Surveying Mill for White Water Losses

"Surveying the Mill for White Water Losses to Indicate Possible Savings" was the title of the paper which followed the presentation of Mr. Gardner's paper. This paper was presented by E. R. Schafer and was the result of work done jointly by Mr. Chidester and Mr. Schafer, both of the Forest Products Laboratory staff.

It was estimated that during 1925 about 700,000 tons of fiber from paper mills were discharged into streams. The report of C. M. Baker for the American Paper and Pulp Association, which is published in full in this issue, estimated that the total saving to the industry at the present time through the utilization of recoverable fiber was approximately $5,200,000 annually. Total recoverable loss due to inefficient utilization has been estimated to be valued at approximately $6,300,000.

Mr. Schafer stated that the paper "Surveying the Mill for White Water Losses to Indicate Possible Savings" covered the results of two mill surveys in which the Laboratory had been called upon to assist.

The first mill survey was of a plant producing daily about 50 tons of sulphite pulp, 50 tons of soda pulp, and 60 tons of wrapping and label paper. The second survey was of a plant producing daily about 40 tons of sulphite pulp, 40 tons of groundwood pulp, and 80 tons of book and catalog. With suitable wiers and sampling stations, it was possible through the survey to make recommendations which have resulted in a saving of 1,000 pounds of pulp per day in the sulphite mill and about 100 tons of pulp per month in the paper mill in the first plant, while in the second mill by correcting the losses it resulted in recovering about one-half of the paper making materials wasted at the time of survey, and an increase of production of groundwood pulp of 50 pounds per cord by installing a closed system for water circulation. These tests, according to Mr. Schafer, have shown that savings may be accomplished not only by the proper installation of save-all equipment, but by improvements in equipment arrangement and operation, and by the elimination of unnecessary wasteful practices.

White Water Re-Use

The next paper on the program of the symposium on waste was presented by L. M. Booth of the Booth Chemical Company on the subject of "White Water Re-Use". Mr. Booth mentioned that the trend today was toward the direct use of white water, in so far as possible, without the separation of its components. He stated that until comparatively recently, shower water for fourdrinier and cylinder machines was almost universally fresh water; while now in many cases

on cylinder machines, making chip and container board, fresh water was used for the felts only, and on fourdrinier machines white water was used for all showers with the exception of sprays and possibly the couch shower.

Mr. Booth suggested the desirability of some chemical treatment for the white water if it were to be used on felts. Chemical treatment of the white water will prevent decomposition. Chlorine, said Mr. Booth, may be used to prevent decomposition of stock while in process of manufacture but it should be used with a full knowledge of the requirements in order to obtain the desired results.

Mr. Booth believes that the white water problem should be viewed as one of papermaking rather than one of waste recovery. Stock which has once been delivered to a paper machine and which has found its way into the white water should be returned directly to the machine. "Conserve and reuse white water" was the slogan offered by Mr. Booth. By so doing, costs of production decline and problem of stream pollution vanishes.

Sanitary Analysis in Pulp and Paper Industry

The sixth paper of the symposium on waste was presented by L. F. Warrick, state sanitary engineer, State Board of Health, Madison, Wis., on "Sanitary Analysis in the Pulp and Paper Industry". Mr. Warrick emphasized the need for standard methods of analysis to insure comparable results from different laboratories and suggested that tentative standards be adopted. In discussing the analysis of pulp and paper mill wastes from the standpoint of sanitary engineering he told how important it was to have representative samples. Apparatus for collecting samples for analysis was described and displayed by Mr. Warrick. He stated that the minimum quantity of a sample should be from 2 to 4 liters. The sample should be analyzed as soon as possible after collection. If the sample was to be kept over 6 hours it should be treated with 6cc. of chloroform per liter of sample. In collecting the samples, Mr. Warrick mentioned that wiers and continuous sampling devices were of assistance.

In continuing his remarks, Mr. Warrick discussed a number of tests which he recommended to be made on the sample. These tests included the oxygen demand test, dissolved oxygen test, oxygen consumed, solids—total and suspended, nitrogen, and acidity and alkalinity. He stated that a pamphlet "Stream Pollution in Wisconsin" might be obtained from the Wisconsin State Board of Health, Madison, Wis.

The Rosin Sizing of Paper

"The Rosin Sizing of Paper" by S. R. Olsen was the next paper presented before the convention. This paper was the result of work for a Master's thesis at the Graduate School of the University of Minnesota where Mr. Olsen was recipient of a Cloquet Wood Products Fellowship.

Mr. Olsen in his paper discussed the early history of the rosin sizing process, adoption of rosin sizing by papermakers, various researches of investigators, and the theories developed.

It was thought pertinent to attempt further study of the rosin sizing process through the use of modern physical-chemical methods to ascertain the effect of hydrogen ion concentration on the quantity of rosin precipitated in the process of sizing and to study the efficiency of the rosin thus precipitated. Experimental methods were reported and series of experiments described. A number of conclusions were drawn; among which were: amount of residual ash in the pulp influences optimum hydrogen ion concentration as well as amount of rosin absorbed; under conditions of the experiments, optimum hydrogen ion concentration for maximum absorption of rosin was from pH 4.5 to 6.5 for commercial pulp and from pH 4.0 to 4.5 for purified pulp; under commercial conditions, optimum hydrogen ion concentration for best sizing is probably from about pH 4.5 to 6.5 depending on type of pulp used; results of experiments indicate no universal optimum hydrogen ion concentration for rosin sizing of paper can be used; and neutral ether extraction does not give a true value for the amount of rosin absorbed.

It was recommended that each mill work out its own standards for the sizing of paper, basing their experimental work on the fundamental principles of this process.

Improving Paper Drying by Atmospheric Control

The last paper to be presented during the morning of the second day in the symposium on waste was by R. Skagerberg, Consulting Engineer, St. Paul, Minn., on "Improving Paper Drying by Atmospheric Control". Mr. Skagerberg stated that the purpose of the paper was to show the advantages of controlling atmospheric conditions in the drying section of a paper machine. Few paper dryers, according to Mr. Skagerberg, have thermal efficiencies exceeding 60 per cent, although by proper design and control of atmospheric conditions it would be possible to attain efficiencies of 70 per cent or better.

Hoods over the dryers helps to reduce the quantity of air to be exhausted but does not stop radiation losses from the dryer cylinders. In some instances the heat loss from the dryers may be increased by increasing the air circulation over the dryers. A properly designed dryer housing with equipment for controlling conditions within the housing, according to Mr. Skagerberg, not only performs all of the functions of the hood, but rectifies some of the faults of the hood, increases the drying capacity of the dryer, reduces steam consumption of the dryer and of the plant as a whole, and improves the quality of the sheet. The conditions necessary for proper drying can be established by control and regulation of existing conditions.

Mr. Skagerberg presented at length interesting data on dryer efficiency, and the results obtained by taking the dryers as they stand, housing them in as far as practical with properly insulated material, and equipping the housed dryer section with means to recirculate and control the heat and vapor to make maximum use of heat radiated or otherwise supplied to the dryer. Improved room conditions, reduction in steam and coal consumption, increased production and increased drying capacity were some of the results mentioned as being obtained by making such an installation as previously mentioned. Test figures of new dryer performance were also given.

Due to the lateness of the hour at the time Mr. Skagerberg completed the presentation of his paper, little time was given to discussion of the papers which had been presented during the morning session. The meeting was adjourned with members of T. A. P. P. I. and guests reassembling at the Wausau Country Club where a buffet luncheon was served.

Mill Visits and Recreation

Following the luncheon a number of technical men visited the plants of Marathon Paper Mills Company and Mosinee Paper Mills Company. Others remained at the country club and played for the D. J. Murray Golf trophy. To make the convention complete several of the guests enjoyed an aeroplane ride from the Alexander Airport and had the privilege of seeing Wausau from the air.

Past President's Dinner

The evening program of the second day was filled with items of much interest. The dinner was in honor of the past presidents of T. A. P. P. I. Four of the former presidents were present.

Mr. Tucker, present president, first introduced G. D. Williamson who told of the things which happened during the days he acted as president of the association. He stated that the country had just emerged from the orgy of 1920 and had entered the depression of 1921. In the paper business quality had been a secondary consideration to quantity. During the days of his leadership a closer co-operation was obtained between the American Paper and Pulp Association and the Technical Association. With the resignation of Thomas J. Keenan as secretary came the appointment of Wm. G. MacNaughton. During the same administration a new budget and accounting system and service to members plans were introduced, and arrangement was made with the Paper Trade Journal to act as the official publication of the association. A definite program of work was adopted during 1922 and a number of committees were organized. Two of the committees mentioned were the committees—Elimination of Waste—Robert Wolf, Chairman, and Paper Drying, headed by S. P. Jones. In April 1922, Mr. Williamson stated that the sceptre of his office was turned over to Howard Taylor.

R. S. Hatch, president of the association immediately prior to the election of Mr. Williamson was next introduced. Mr. Hatch mentioned that during his administration, movement had been started to obtain an official organ for the association, the vocational education committee was definitely organized and work on the text books begun. Membership was said to have increased greatly during Mr. Hatch's administration. In concluding his remarks, he stated that he felt the time was opportune to suggest a joint meeting of the Canadian Technical Section with T. A. P. P. I. if such a meeting could be arranged.

W. G. MacNaughton was then introduced as a president of the association who had served only a brief time, having been called West shortly after inception to office. In going West, Mr. MacNaughtor changed offices with Harry Carruth, Vice President.

Mr. MacNaughton in his remarks stated that he was elected president in February 1917 and during the latter part of March went to Spokane, Wash. He remained four years in Spokane and returned East in 1921 to become secretary of the association.

Mr. MacNaughton recalled the early meetings of the association, mentioned the conditions in the industry as Mr. Williamson had done, and mentioned the early development of methods for testing wood pulp.

He suggested that the lines of work of the association should follow the leading interests of the industry. Little value would result from work in which only a small group of technical men were interested. The bulk of the members should be interested in the problems studied by the association.

In continuing his remarks, Mr. MacNaughton mentioned the development of close and active interest between the technical men in the pulp and paper industry and the technical men in mechanical and chemical engineering lines. He stated that credit should be given to engineers representing manufacturers of machinery, chemicals, and supplies who have taken active part in the work of the association. The work of the Forest Products Laboratory was mentioned. In concluding his remarks, he called attention to the world wide membership of the association, all members being on an equal basis.

The fourth past president to speak before the convention was Harry Fletcher, who, although the last past president to speak on the program, was the first president of the association. Mr. Fletcher told of the association development as the realization of a dream. He spoke about the idea before a group meeting of representatives of the American Paper and Pulp Association in 1912. Mr. Fletcher mentioned that among those present at the original meeting in New York was M. L. Alexander, President of the Nekoosa-Edwards Paper Company. Mr. Alexander was present at the banquet at Wausau and received a hearty cheer from the entire association gathering.

With the sanction of the American Paper and Pulp Association, Mr. Fletcher stated that a questionnaire was sent out to all mills in the country to determine the status of the technical men in the industry. Sometime later, a group of six men met in Chicago and worked out the organization plan for the association. The motto of the association should be, according to Mr. Fletcher, "Service above Self".

Award of Gold Medal to W. H. Mason

The remarks of Mr. Fletcher concluded the past presidents talks. Mr. Tucker then called upon Mr. Williamson to present the T. A. P. P. I. gold medal to W. H. Mason for his outstanding contribution to the advancement of the pulp and paper industry. In presenting the medal, Mr. Williamson stated that Mr. Mason had been born in West Virginia; had attended both Washington and Lee and Cornell Universities; served as ensign in the navy during the Spanish-American War; was in the employ of Thomas A. Edison for 16 years; at outbreak of world war was given appointment as superintendent of construction of Government shipyard at Bristol, Pa.; after war entered employ of General Motors; and in 1920 developed process for extracting naval stores from lumber. From this last work, he conceived the idea of exploding wood, the wood being discharged from a specially designed gun under high pressure. The result of this work is the product "Masonite". In addition to the process for the production of Masonite, Mr. Mason has originated a process for the production of a product in which they say that the fibers are practically welded together. The trade name for this product is Presdwood. With these remarks, Mr. Williamson presented Mr. Mason with the first gold medal to be awarded by T.A.P.P.I.

In receiving the medal, Mr. Mason expressed his gratitude to the association and spoke briefly on the two products previously mentioned. Throughout the entire discourse was stressed the idea of conservation. In discussing Masonite, he stated that it was produced from waste wood from the sawmill. The use of Masonite in building construction was said to permit a smaller investment in heating plant, and it was estimated that a saving of 20 to 40 per cent in fuel would, likewise, result from the use of the product. A more intangible item, perhaps, was that through the proper use of Masonite, workers become more healthful and efficient. The uses of Masonite as insulating board, and as a sound corrective in rooms with poor acoustic properties were stressed.

Mr. Mason stated that Presdwood was finding many new uses. A recent use that had been brought to his attention was as a lining for concrete forms. Other uses such as in motor cars, door panels, motor boats, outdoor signs, etc., were discussed briefly.

Gold Medal Award to Ogden Minton

R. S. Kellogg was called upon by Mr. Tucker, when Mr. Mason had concluded his remarks, to award a similar T. A. P. P. I. gold medal to Ogden Minton for his outstanding contribution to the advancement of the pulp and paper industry. Mr. Kellogg said that Mr. Minton was also a Cornell man, and that both Mr. Mason and he were members of the technical association. He correlated the development of the Minton vacuum dryer for paper machines with the development of aeroplanes.

In accepting the medal, Mr. Minton expressed his appreciation for the honor which had been conferred upon him. He then briefly outlined the work of an inventor, stating first that the school of life was a hard taskmaster. The conception of an idea, according to Mr. Minton, is a small part of the task in the production of an invention. Many problems must be overcome between the concept of the idea and the realization of the idea in the form of the first commercial machine. When the invention has assumed commercial form, the device is much simpler than the original. The hardest job, according to Mr. Minton, in the program of the development of an invention is still ahead. Others must be convinced of the merit of the invention. A first customer must be located. The first machine must be put into productive operation. All of this work must be done with bare chance of reward. Skeptics are on hand to state that the operation of such a device is impossible. Such criticisms are only natural but often unwarranted.

In the development of the vacuum dryer, Mr. Minton stated that his work had taken him into many paper mills. From this experience he wished to emphasize an expression made by W. W. Cronkhite of the General Electric Company before the annual convention of the American Paper and Pulp Mill Superintendents held at Pittsfield, Mass., on May 31-June 2, 1928. Mr. Cronkhite stated that the art of paper making was fast becoming the science of paper making.

In concluding his remarks, Mr. Minton said that the award which had been given to him should also be shared by his partner. The name of his partner was given as Mr. A. Vacuum Dryer.

Address by D. Clark Everest

With these concluding remarks Mr. Tucker introduced D. Clark Everest, Manager of the Marathon Paper Mills Company and President of the American Paper and Pulp Association.

Mr. Everest spoke most interestingly on problems confronting the industry. He told of many tales of woe in the

various branches of the industry which had been brought to his attention. Some complained of overproduction. Others complained of uncontrolled production from new localities.

In his discourse, Mr. Everest mentioned the names of several old books. One of these books was published in 1800 by Matthias Koops. A portion of the book according to Mr. Koops' statement was printed upon paper made from wood alone. The remainder of the book was printed upon paper which had been produced from straw. In reading extracts from Matthias Koops' manuscript, a number of remarkable predictions were emphasized. Koops discussed substitutes for linen rags, deinking of waste papers, advanced idea of safety paper, suggested use of new raw materials, and the development of new products.

Mr. Everest described briefly the early organization of the Technical Association and its growth to the present time. He mentioned that co-operative effort had put the industry on an increased plane, and suggested that it was important to consider the development of new uses for pulp and paper products.

There is a need for a new order of technicians in the industry, according to Mr. Everest. These men must know the use requirements of the consumed products and would be responsible for the development of increased markets through increasing the want requirements of present products and through the creation of new uses for both pulp and paper.

Production without profit, said Mr. Everest, is of no benefit to anyone. Intelligent management with necessary information at their disposal should not flood the market. He complimented the work of the technical and operating staffs throughout the industry for their constantly increasing effort to reduce costs, and congratulated the technical association for the beneficial work it had done.

Mr. Everest's address concluded the evening program and the meeting was adjourned until shortly after 9 A. M. the next morning when Mr. Tucker called the meeting to order for the presentation of papers of the technical control symposium.

THIRD DAY'S SESSION

Technical Control Symposium

W. F. Moore of the United States Testing Company, Inc., was introduced as the first speaker for the morning symposium. Mr. Moore's paper was entitled "The Bronze Rod Mill for the Strength Testing of Woodpulp".

Bronze Rod Mill for Pulp Strength Testing

This paper was the result of work done in the laboratories of the United States Testing Company, Inc., due to a feeling that the porcelain jar using flint stones was not a satisfactory means of hydrating pulp. The Abbe Engineering Company supplied the United States Testing Company, Inc., with a bronze jar which had been machined to exactly the same dimensions as the porcelain jar (Model C) used for the comparison. The jar had an inside diameter of 9 15/16 inches and an inside length of 14 3/16 inches. Experimentation with the bronze mill showed that the ash content of the pulp was the same at the end of the beating test as at the start thus eliminating one of the disadvantages of the porcelain jar. By using a manufactured pulping agent (steel rods) a uniform and easily reproducible stock was obtained. The jar having been machined could be readily duplicated.

According to Mr. Moore, all of the variables present in the use of the porcelain mill were eliminated through the use of the bronze mill. The experimental work with the bronze mill, in attempting to standardize and develop a procedure for commercial work with it, was made with the several objectives of overcoming all disadvantages of the porcelain mill, of securing a flexible and accurate procedure, and of securing the fastest possible hydration consistent with ease of manipulation.

The result of this work has shown that the bronze jar is exactly reproducible; the ash content of the pulp with the bronze jar is no greater at the end of a run than at the begining; the pulping agents are of uniform size, while a big variation is apparent in the pebbles used in a porcelain jar; bronze balls seem unsatisfactory for use with a bronze jar; small and large buckoids (cast iron clam-shaped objects) are more satisfactory than bronze balls; and that steel rods are satisfactory for use in the bronze mill in every respect.

Technical Control for Paperboard Mills

The second paper on the morning program of the third day was presented by E. F. Whittington, chief chemist of the Sutherland Paper Company, Kalamazoo, Mich. The paper was entitled "Technical Control for Paperboard Mills". Mr. Whittington told of the laxity of proper control in the this work among the mills at present. The full text of this paper appears on another page of this issue.

Mill Demonstration of Sulphite Pulping Control

The next paper, "A Mill Scale Demonstration of Temperature Control in Sulphite Pulping", was presented by C. E. Curran of the Forest Products Laboratory in the absence of G. H. Chidester who had actually done the work upon which the paper was based. Mr. Chidester in his paper stated that investigations at the laboratory have shown that the rate of increasing the temperature during the cooking operation was the most important single factor affecting the yield and strength of pulp. In following a temperature schedule, the first step to accomplish is a thorough penetration of the chips by the acid before reaching 110°C. Also it is important to keep the final temperature of the cooking period as low as possible, since high temperature may reduce both the strength and yield of pulp.

The mill, in which the demonstration of temperature control was performed, required an output of 80 tons of spruce and eastern hemlock pulp each 24 hours from three digesters of a capacity of 12 tons each. By instituting temperature control, the amount of screenings was reduced one-half, which over a week period corresponded to a saving of pulp in an amount equivalent to the production for one digester; time required to run the stock from blow pits was increased 15 to 30 minutes; and the yield of pulp was increased by at least 5 per cent. Such data certainly indicated the importance of temperature control in the cooking operation of a sulphite mill.

Technical Control in the Soda Pulp Mill

E. S. Hinman of P. H. Glatfelter Company next presented his paper on "Technical Control in the Soda Pulp Mill", which appears on another page of this issue.

Alkaline Pulp Mill Control Method Problems

C. K. Textor, Northwest Paper Company, followed Mr. Hinman in the presentation of his paper with a paper entitled "Alkaline Pulp Mill Control Method Problems". Mr. Textor confined his paper largely to the evaluation of pulp and pulp wood, having mentioned that laboratories in various soda and sulphate pulp mills had given a great deal of attention to chemical and physical methods for control of process work, but methods for measuring the value of the chief raw material—wood and the product, wood pulp—had been very slow in developing. According to Mr. Textor, the development of an adequate method for evaluating the paper making properties of a pulp constitutes, in the opinion of many operators, the most important present day problem in the control of soda and sulphate processes. Present methods are not sufficient in the opinion of Mr. Textor.

He also stressed the inadequacy of the cord measure as a basis for wood purchase. Measurements on wood actually presented for purchase showed that the solid wood contained in several cords varied all the way from 60 to 108 cubic feet per cord. Since the amount of pulp which can be produced from a cord of wood is almost directly proportioned to the weight of dry wood in the cord, it seemed that the apparently logical way to measure pulpwood would be by weight. The technical problem would, therefore, be in this case to develop a satisfactory and practical method of determining moisture content in pulpwood. Rate of growth

and decay of wood were also discussed as to their effect on yield of quality of pulp.

Mr. Textor's paper resulted in much discussion about the merits of present methods of evaluating pulp and the need for more scientific study along this line.

Application of Meters in Pulp and Paper Mills

Two other papers were presented during the session of the technical control symposium. The first of these papers, following immediately after the discussion of Mr. Textor's paper, was presented by R. V. Knapp of the Bailey Meter Company on "The Application of Meters and Instruments in Pulp and Paper Mills". The full text of Mr. Knapp's paper is published on another page.

Standard Electrical Control Apparatus

The last paper on the program of the technical control symposium was presented by R. T. Kintzing of the Westinghouse Electric and Manufacturing Company. Mr Kintzing's paper was entitled "Standard Electrical Control Apparatus in the Paper Industry".

Electrically driven machinery in the opinion of Mr. Kintzing was nowhere more extensively used than in the paper industry. He also stated that, to a greater extent than in most industries, standard or general purpose motors were used. Ordinarily, he said, that the choice of a suitable motor involved only the selection of a motor having right horsepower and speed characteristics. However, suitable control apparatus cannot be chosen so readily.

Controllers were classified by Mr. Kintzing as to type. Following the classification, he discussed the various types of motors used by the industry with the varieties of controllers used depending on application. A table showing papermill applications of control was included in Mr. Kintzing's paper with the hope that it would be of use to the engineering members of the industry as a reference for selecting more suitable types of control.

In concluding his remarks, Mr. Kintzing stated that the best control apparatus was not always the cheapest. Consideration must be given to importance of good design, both electrical and mechanical, and the ability of the manufacturer to furnish prompt and efficient service.

Mill Visits and Entertainment

The presentation of this paper concluded the technical control symposium. With the adjournment of the meeting luncheon was served at the Elks Club and the early part of the afternoon spent in visiting the plants of the D. J. Murray Manufacturing Company at Wausau, and the Wausau Paper Mills Company at Brokaw. A number of interesting developments in the way of pulp and paper mill machinery were viewed in the D. J. Murray plant. At Brokaw everyone had the privilege of studying the new high pressure boiler installation with its pulverized fuel equipment as well as the new hydroelectric development. The plant was also thrown open for inspection and a trip through it was, likewise, enjoyed.

At 4:00 P. M. a "North Woods" program was enacted at Rothschild Park. In this program everyone present had the opportunity of viewing a log rolling contest with its many thrills, as well as equally interesting spectacle of landing human fishes. Prior to the supper which was held at the Rothschild Pavilion a group of Menominee Indians put on a "pow wow" in which W. G. MacNaughton was taken into the tribe. It was an experience which Mr. MacNaughton, and those who were privileged to view it, will long remember.

A playlet entitled "The Next Morning" was presented as the concluding act of a most helpful and interesting three day program. This playlet concerned the functioning of a paper testing laboratory in a paper mill. Many a good laugh came from its presentation. Surely every technical man and every paper mill superintendent present received a better understanding of some of the "Whys and Wherefores".

Everyone who attended the convention must have left with a feeling of satisfaction, of three days well spent, and with a desire to return to Wausau at their first opportunity. It was by far the best attended fall meeting yet held by the association.

Geographical Distribution of Registrants

Following is a geographical distribution of the registrants:

Alabama	1	New Jersey	5
Connecticut	4	New York	33
Delaware	1	North Carolina	2
D. C.	2	Ohio	11
Illinois	40	Pennsylvania	7
Indiana	4	Washington	1
Louisiana	2	West Virginia	2
Maine	1	Wisconsin	111
Massachusetts	9	England	3
Michigan	37	Canada	6
Minnesota	22	India	1
Mississippi	1	Hungary	1
Members			183
Non-members			90
Ladies			34

Registration Tappi Fall Meetings

1924	Buffalo	approximately 150
1925	Kalamazoo	146
1926	York	162
1927	Middletown	135
1928	Wausau	307

Control of Stock Losses in the Paper Mill*

By A. T. GARDNER

Combined Locks Paper Company, Combined Locks, Wis.

THE various stock losses in the paper mill may be classified as continuous and intermittent. The continuous losses are white water from the paper machines while the losses which are intermittent may come from several sources among which are overflowing of stock chests, wash ups, and changes.

Analytical Method

To have control of the losses it is necessary to have a complete survey of the mill so that all the small losses which make up the total loss can be determined. The survey should be made over a period of at least two months so as to include the various grades which are run. The method for measuring the quantity of water depends upon the local conditions but in most cases the weir can be used.

For concentration of stock or pounds per thousand gallons a representative sample of 50 cc. is filtered using a weighed filter paper. After filtering, the filter paper is dried and weighed. The increase in weight representing the bone dry stock. In the case of filler being present, it is necessary to make an ash determination so as to have the per cent of filler in the stock. The above data are then computed to pounds per thousand gallons and per cent of clay. Figure 1 is a representative form used in making a survey.

The Mill Survey

A complete survey should show the method of control best suited for the individual mill. The best results can be obtained by returning to the machine for makeup, that white water which has the highest concentration of stock. In mills using trays under the wire, the white water can be classified according to its concentration in the following manner—tray water, suction box water, suction couch water and wire pit water. The first mentioned has the highest concentration and the last, the lowest. In some mills the tray water and suction box water are mixed and used for makeup. The excess water is then passed through a save-all.

It has been found practical to keep the white water from these two sources separate so that the excess water will only consist of suction box water. This is done by means of a mixing box built with three compartments. The tray water

*Presented at fall meeting of the Technical Association of the Pulp and Paper Industry, Wausau, Wisconsin, September 26, 1928.

is run into one compartment and the suction box water into another. The third compartment is used for the overflow. The fan pump is connected to the tray compartment and in order to to maintain the level in this section the dam separating the tray water and suction box water is constructed so as to operate by means of a float. The top board of the dam is hinged at one end and connected to a float which operates with the level of the water in the tray compartment. The

FIGURE No. 1

SURVEY OF WHITE WATER LOSSES

DATE
MACHINE NO. FURNISH
GRADE OF PAPER SULPHITE
SPEED FT/MIN GROUNDWOOD
PRODUCTION SIZE
NO. OF SHOWERS ALUM
PRESSURE ON SHOWERS FILLER

SAMPLE	WEIR LENGTH	HEAD ON WEIR	GALLONS PER 24 HOURS	LBS/M GALS. FIBER	LBS/M GALS. FILLER	LBS/M GALS. TOTAL	LBS/24 HOURS FIBER	LBS/24 HOURS FILLER	LBS/24 HOURS TOTAL	DISTRIBUTION OF LOSSES IN PERCENT MACHINE	DISTRIBUTION OF LOSSES IN PERCENT TOTAL
FURNISH											
TRAYS											
SUCTION BOXES											
TO SAVEALL											
WIRE PIT											
PRESS PIT											
SUCTION COUCH											
SUCTION PRESS											
TOTAL											

overflow dam is regulated according to the depth of water desired in the mixing box. At times considerable suction box water is required for makeup and other times the tray water is sufficient to supply the machine.

Reduce Shower Water Requirements

The wire pit water consists of the white water from the wire between the last tray and the first suction box and also the wire showers. The problem in this case is to decrease the amount of shower water so as to increase the concentration of fiber. It has been possible where mills were using the old type of showers to install new showers which required only 50 per cent of the amount of water without reducing the pressure of the shower water. When the stock content of water is below one pound per thousand gallons, it is not practical to try to reclaim the stock. The problem then is to try to reduce the water as in the case above or allow the water to go to waste. This does not include water which can be used in a recirculating system.

Reclaiming System in Book Mill

Figure 2 shows a system used in a book mill for the reclaiming of the stock in the white water from the paper machines.

In this case the saveall pit under the machine is used in case of a break. The shower No. 2 forces the sheet off of the wire and when the pit is filled the stock is dumped into the machine chest by means of the hand operated plug. When trimming on the wire it is advisable to build boxes which are piped directly to the machine chest so that the trimmed edge will not build up the stock in the saveall pit. This method relieves the machinetender of watching the saveall pit except in the case of a break at the wire. The compartments in the pit under the wire are separated by dams which are built so that the saveall pit overflows into the suction box water pit which is connected to the saveall and the latter overflows into the wire pit. This prevents the thick stock from the saveall pit from overflowing to the sewer and allows the suction box water to flow to the sewer when the saveall is shut down during a wash up.

In order to enrich the wire pit water a separate pen can be constructed so as to catch the white water coming from the wire between the last tray and first suction box. This pan is built two feet narrower than the pit so that it is one foot from each sill. This allows the grease or oil from the table rolls to drop into the wire pit. The pan is placed at an angle so that the water will drain into either of the two openings. The first opening permits the water from the pan to pass to the sewer and the other opening allows the water to pass through the saveall. A platform is built over the suction box pit to carry the water from No. 3 shower into the wire pit.

The filtered water can be used for shower water or in the beater room. In some cases this water is cleaner than the

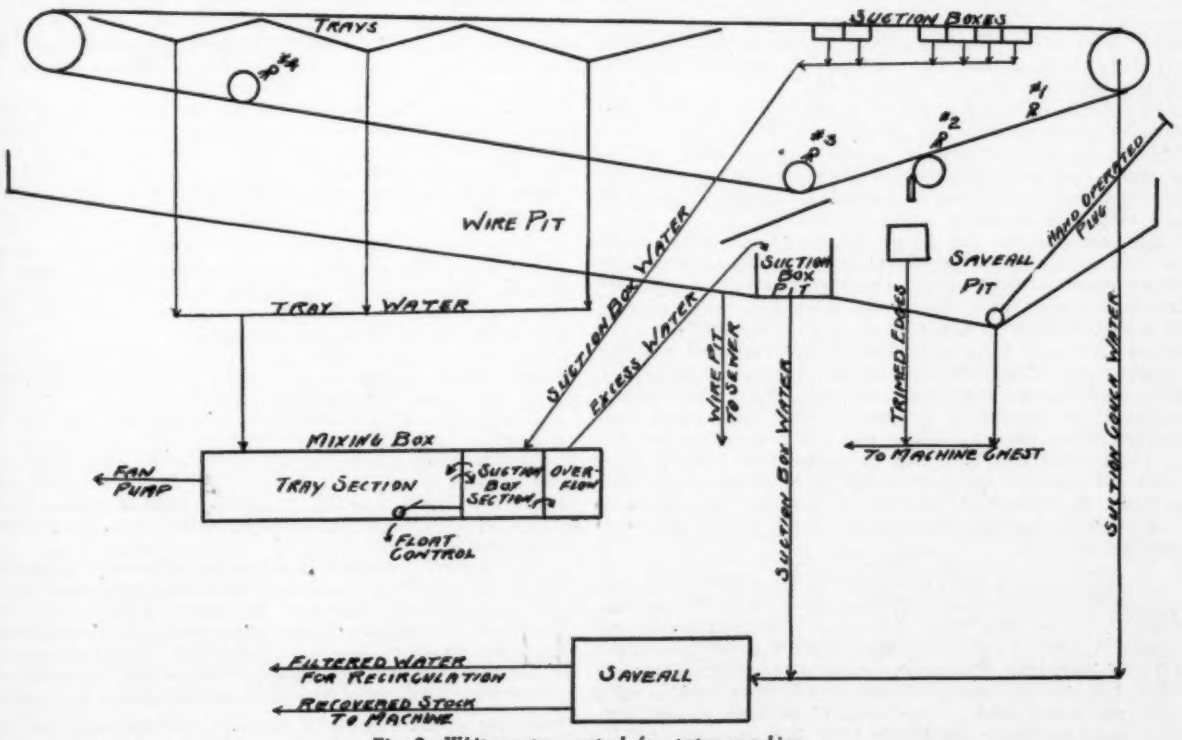


Fig. 2—White water control for paper machine

fresh water. When using the filtered water in the beater room care should be taken that the water does not color up, when running colored paper, as this may cause trouble in matching shades.

The balance of the stock losses are intermittent. This includes washups, changes and stock chest overflows. In the case of washups and changes the savealls should run until the saveall pit has been dumped. This prevents a large loss of stock. The balance of the losses are due to cleaning screens, dumping flow boxes and cleaning out jordan boxes. A separate saveall should be used for handling these losses. As these losses are not continuous one saveall is sufficient for all machines. Due to the fact that this stock is usually of poorer quality it can be used in a lower grade of paper such as wrapper stock.

By means of automatic alarms and light systems operated by float valves it is possible to prevent the overflowing of stock chests. In mills where this has been tried out it was surprising the number of times the alarm would sound, showing that before using this system some stock was lost from this source. After a few months of operation the men become more careful of the height of the stock in the chest and this loss is stopped.

Automatic Sampling

For obtaining daily data on the stock losses from each paper machine it is necessary to have a weir equipped with an automatic sampling device and water level recording meter on each machine sewer. The automatic sampling device can be either motor driven or built with paddles so as to operate with the flow of water through the weir box. The latter gives more accurate results for when the flow increases the sampling device is speeded up so that more samples are taken. It therefore takes approximately the same number of samples per thousand gallons. In the motor driven sampler a definite number of samples are taken per minute regardless of the quantity of water. Samples taken every fifteen minutes will show a big variation during washups. In most cases when a sample is taken at the beginning of a washup it will be twice as rich in stock content as the sample taken during normal operation. Because of the variation in flow and richness of the white water it is impossbile to get accurate results without the automatic sampler and recording meter. It is possible to detect losses which occur at night and find out the time of the loss from the water level chart. During normal operation the effluent is fairly constant so that any increases in loss increases the effluent which is recorded on the chart.

In order to have a record of the losses for each shift, the samples from the automatic sampler can be run into a pail from which a representative sample for each shift can be obtained. All machine tenders will not use the same amount of water and it is therefore possible to secure a record of this from the recording water level meter.

Each machine has its own peculiarities and it is necessary to make a daily inspection of each machine. Warmer weather which causes freer stock on the wire changes the flow of water into the trays and it is necessary in some cases to make changes in order to remedy this situation. The first tray may be too small to handle this increased quantity of water and if allowed to overflow will cause considerable loss. Also through neglect on the part of machine tenders, especially on starting up Monday morning, losses occur from various places on the machine which if not checked up will not be noticed and therefore not taken care of. In most mills the problem of stock losses is of great enough importance to warrant a separate department for this work and from the savings obtained has proven a very profitable investment.

Government attorneys have carried to the Court of Customs Appeals at Washington a ruling by United States Customs Court at New York admitting newsprint paper imported by the J. P. Heffernan Paper Co., of New York City, without duty. The paper was admitted under paragraph 1672, but the Government claims a tax of a quarter of a cent per pound and 10 per cent ad valorem should have been assessed under paragraph 1301.

Technical Control for Paperboard Mills*

By E. FRANK WHITTINGTON
Chief Chemist, Sutherland Paper Co., Kalamazoo, Michigan.

INASMUCH as the tonnage of board produced in 1927 represented 37 per cent of the total production of all paper, which was 9,741,000 tons, it would seem only logical that the board mills should lead in technical control but we who have succeeded in wedging ourselves part way in, must confess with regret that our section of the industry is rather behind the times. I say with regret but not with discouragement we admit this because we are now forging ahead and are being pushed ahead just as the fine paper mills were by consumer demands.

Because of the fact that board mill control is not very widespread as yet, this paper must of necessity, be largely theoretical and being theoretical is (in the words of Charles E. Carpenter) worth what one man thinks. It would be better to head this paper "Possibilities of Technical Control in the Paperboard Mill."

Probably the most logical place to begin our board control work is on the incoming raw material. Obviously, we cannot make a uniform product with non-uniform materials.

Standards will have to be set arbitrarily by taking as the standard a certain lot or lots of the material in question which seem to prove satisfactory. It may be found advantageous to raise these standards later or it may be necessary to lower them.

Water

What materials can we test and are there any which we cannot control? The largest item as to volume in the process is water. It certainly would be good if we had ample storage capacity so that we might treat chemically all of our water before it gets to the mill but I believe that the necessary equipment and space are not warranted by the slightest advantage gained because the water can be treated in the beater as used and satisfactory results may be obtained.

Pulp and Shavings

Next in importance is the pulp. This should be subjected to a moisture test and also a beater test and the strength and fold determined. A dirt count should also be made on the original samples. We handle the latter by taking disks at the same time that we take samples for moisture test. So much has been said and printed regarding strength testing of pulp that I need not stress its value here.

Along with pulp, we should consider shavings and clippings, which should be examined for excessive moisture, groundwood in sulphite shavings, and soda pulp in supposedly straight sulphite.

New bales also must be watched for excessive moisture and iron nails.

Size, Alum and Fillers

Size and alum are important chemicals which should be studied. The companies supplying the former are few and large and maintain efficient laboratories. Although discrepancies will be rare, accidents happen.

The matter of size analysis is being handled by the Materials Testing Committee of T.A.P.P.I., but for routine mill control purposes, I believe that total solids, total rosin and free rosin are sufficient and in many cases, the latter may be omitted.

Size emulsion should be tested constantly. This is where you will get a variation. Keep it uniform as to solids content. The same remarks in general could apply to alum, except that there are more producers and consequently more variations are likely.

Starch should not cause any trouble unless dirt is present. We have never been troubled in that way in our mills.

Clay or mineral filler must be compared with established standards for color. Other tests would be fineness and moisture.

The preparation of colors offers fertile field for adulteration, which I believe is practiced to quite an extent. Adul-

*Presented at fall meeting of T.A.P.P.I., Wausau, Wisconsin, September 27, 1928.

terated colors are often obtained if the purchasing agent is anxious to buy on price. Solubility and color strength are the principal tests. The strength being compared with a standard by dipping a V-shaped filter paper in solutions of same percentage strength of standard and sample. In the case of mineral colors which are insoluble make a "draw down" of the color by diluting it with a good white china clay, moisten with mineral oil and draw down with a spatula on white paper. The standard and sample are drawn down together and where the two pastes meet it is easy to distinguish a small variation in color.

Beater Room Control

Following the control of raw materials comes the manufacturing process and we, of course, must start with the beater room. One of our machine tenders told me "give us good stock and we will make good paper." A very obvious statement but probably the most neglected factor in the board mill.

The old phrase "anything goes in board," has been too dominating a force for our own good.

In beater room control, we can and should, apply all the tests and control methods used by the finer paper mills and I am certain that we could profit by them.

First we should control the furnish. Moisture tests on pulp will aid here. Weigh out the various pulps or shavings for each beater. Beater capacities should be figured on a bone dry basis. Starch or filler must be weighed or measured although the former is rather difficult to handle. Size and alum are generally handled in solution form now and may be accurately measured with little difficulty. Measuring the alum is of less importance, however, since we are going to use the pH measurement to insure uniform sizing in consecutive beaters.

Better sizing will be obtained if the stock is neutralized immediately after furnishing. To insure a uniform weight on the machine consistency regulators or some means of rapidly making a consistency test should be used in the beater room and the beaters always dropped with a definite amount of water. The freeness test should be used on the liners in particular and will be helpful on the fillers as well, especially when running board which must have good bending qualities. Slow stock will never make a good bender.

The freeness test should govern the beating time and beaters dropped with the definite freeness which has been established for the various grades of board made.

Board Machine Control

Perhaps some who may hear or read this will not know just how board is made so let me explain very briefly. Board is built up in layers on a cylinder machine, each cylinder acting as a sheet mold to form a thin sheet, which is couched onto an endless felt and carried to the second cylinder where another sheet is couched onto the first and so on for five, six or seven cylinders. The first and last or two outside layers of the board are called liners and the others are known as fillers. Some times the second layers are called an underliner.

Next will come the machine control tests, first, of course, being the more obvious ones such as basis weight and caliper. The second is very important when selling on sheet count and must be considered also when selling on weight only as the customer is entitled to the maximum number of sheets to the hundredweight.

Moisture must be checked. Excessive drying is a costly operation and will usually cause curling when the board is later subjected to a humid atmosphere. The amount of moisture to have in the board will vary considerably with the treatment it is to receive after leaving the mill. We have had orders where 5 per cent moisture was demanded and delivered too. Other times, we have found it desirable to leave 7 or 8 per cent of water in the board. When the proper amount has been determined, tests should be made as often as every hour, or if reels are being made, then each reel should be tested. Caliper and basis weight can be determined on the same samples and I figure my moisture on the weight of the sample as it leaves the machine.

The next test of importance is that of finish. The necessity of this test will be governed by the use of the board. Our product is practically all used for printed cartons. Finish can make or ruin a print job as was evidenced in our plant a month ago. The printing department tried to use two different runs of board on the same carton job and ran into specking on one lot due to picking and as was expected, I found considerable difference in per cent of gloss as determined by the glarimeter.

Physical Tests

Size testing is very important on some grades of board or perhaps I should say, would be important if we had a really suitable means of testing it. The nature of the material is such that an accurate measurement is difficult to obtain. Part of the sheet is hard sized and the middle layer will probably be unsized. It is not fair to use such a sample since it prevents comparable results when you allow the large amount of unsized stock to interfere with the size test on the small amount which is sized. This, I believe, is a good problem for the Paperboard Committee of T.A.P.P.I. to work on.

The Mullen test results are valuable to the superintendent in making various runs on the same grade, uniform. It is not usual that a Mullen test is specified on boxboard, while on container board it is required.

The tearing strength of board is, in my estimation, of no value, while the tensile strength and fold are of great importance. It is true enough that board is not going to stand a great deal of folding but with board that is going into folding cartons or shipping cases, it certainly should stand some, and the higher we can get the fold, the better looking cartons will we have. A tensile strength test after folding and also after creasing will tell us a great deal as to the quality of boxes that the board will make.

Some work along this line has been done at the Mellon Institute under the Paperboard Industries Fellowship. Their results indicate that after scoring and giving one double fold, the tensile strength is reduced on an average about 50 per cent. They also found that the Schopper folding tester for board gave very erratic results so before we can run folding tests which will be of any value, it will be necessary to devise a machine for the purpose. This suggests more work for the Paperboard Committee of the Technical Association.

Ash tests might be valuable in checking up mineral filler retention, providing the liner only is used on the test. Newspapers give very unreliable ash tests and could not be made with any hope for intelligible results.

Another test which will have no bearing on the quality of board but will prove of value nevertheless, is a weekly check on the white water from each cylinder of each machine. A loose collar can waste much stock and this will show up in the test. We do not attempt to actually measure the solids in these samples but base our reports on a purely observation basis. The samples are lined up in a test tube rack and a small leakage will show up as a more cloudy white water. A centrifuge can be used to advantage here if one is available and numerical values can be determined.

In the preparation of this paper, it has not been the intention of the writer to bring to you information as to actual results obtained by the application of technical control because results of a definite character are not available, or only partly so. The intention has been rather to bring before you the possible application of well known control tests in the manufacture of paperboard.

Summary

Briefly summarized the tests for paperboard should include:

1—Analysis of incoming raw materials.
2—Weighing of beater furnish.
3—Check of size and alum solutions.
4—pH, freeness and consistency of beater furnish.
5—Basis weight and caliper of sheet.
6—Moisture of finished board.
7—Degree of sizing.
8—Surface finish or gloss of board.
9—Ash content of board.
10—Bursting, tensile and folding strength of board.

Application of Meters and Instruments in Pulp and Paper Mills[1]

By R. V. KNAPP
Bailey Meter Company

THE need for dependable and accurate meters and instrument for application to the many phases of pulp and paper making is well recognized by everyone connected with that industry. Therefore, it is the purpose of this paper to endeavor to indicate the points of application where it is felt that an installation of such equipment would prove a paying investment.

Nearly all the applications covered are indicative of installations that have been successfully made but a few cover possibilities for future development on the part of the meter manufacturer.

The growth of applications has been proportional to the development both of meter and instrument equipment and manufacturing methods, as many of our present day meters and instruments were originally designed at the request of some prospective user. At the same time, refinements in manufacturing methods caused by the necessity for conservation of raw materials and increased competition have made installations advisable at the present time that were formerly unnecessary for profitable operation.

Originally the instrument equipment of a plant consisted of pressure gauges and indicating thermometers. To these installations were gradually added draft gauges, feed water meters, boiler meters of the steam flow-air flow type wherein the rate of flow of air to the furnace for combustion is correlated to the rate of steam flow from the boiler as a guide to combustion economy or the combination of steam flow meter and CO_2 recorder and the various flue gas, steam and water temperature and pressure recorders needed in the boiler room.

In the mills, steam distribution meters to departments, pressure and temperature recorders, liquid level gauges and water meters have been added, which brings us to the present time, when it is necessary to measure steam and water consumption within departments and other vital factors in order that each process may be carried to completion as economically as possible.

In looking for application of meter and instruments to assist in cutting the cost of production, the boiler room will not be considered further as much has already been written concerning applications there, so that the possibilities should be well known and need no repeating, even though a large number of plants are wasting good fuel by failing to properly equip their boilers.

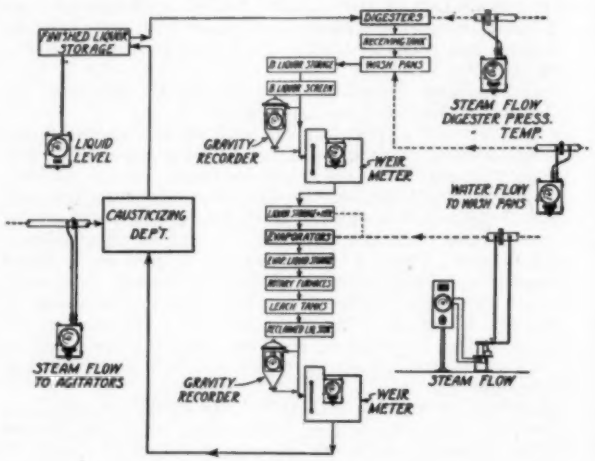


Figure 1

Soda and Sulphite Pulp Mills

The production of pulp shall be considered first, especially that of soda pulp, since in the production of soda pulp several applications of meter equipment, not generally made, are possible, particularly in the recovery department, the operation of which is all important as regards the profit making ability of the mill.

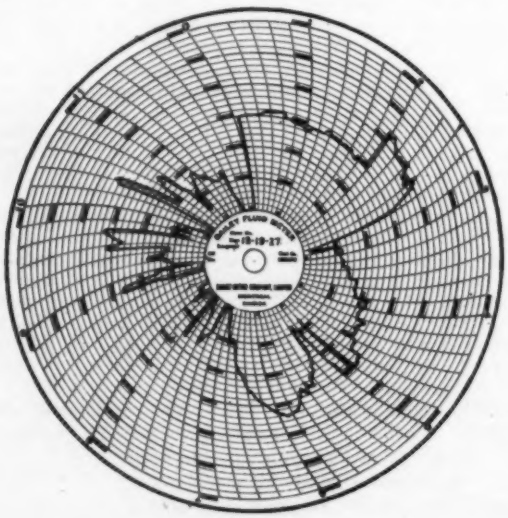


Figure 2

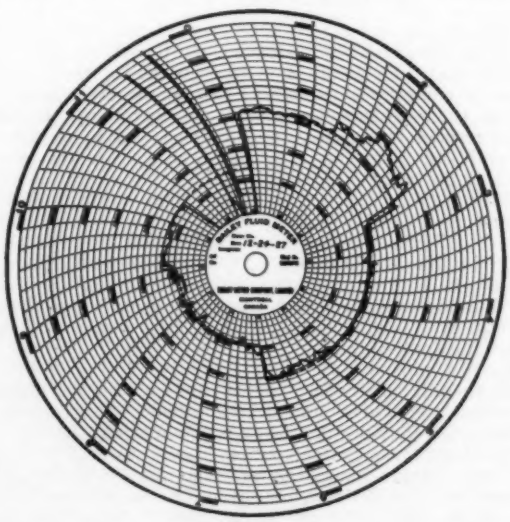


Figure 3

[1]Read at the fall meeting of the Technical Association of the Pulp and Paper Industry, Wausau, Wis., September 27, 1928.

The flow of caustic liquor in a soda mill through the digester and recovery plant is shown diagrammatically in Figure 1 and the point of application of meters and the more important instruments shown. No attempt has been made to show all the pressure and temperature indicators

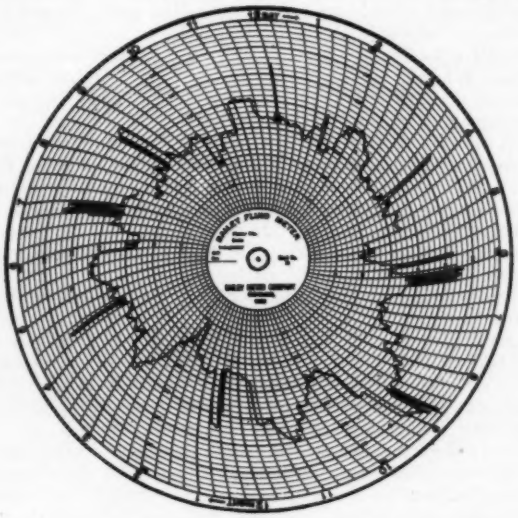


Figure 4

and recorders that may be desired, as the type of major equipment installed governs their necessity.

Starting with the digester it is desirable to know the quantity of liquor with which it is charged, which may be obtained from a liquid level recorder installed on the liquor storage tank.

In nearly all plants the steam supplied the digesters is metered and the steam pressure and temperature recorded but the application to individual digesters is not so general and is really more essential in that the rate and period of steam admission has a very decided effect on the quality of pulp produced.

Figures 2 and 3 are reproductions of charts taken from a digester. This digester is in a sulphite mill so the characteristics of the cook differ somewhat from that of a soda mill and undoubtedly differs from that of other sulphite mills as many methods of cooking are employed, but they illustrate very well the control of steam admission that is possible for each step of the cooking process and that a definite system of cooking is employed.

Figure 2 illustrates the operation being obtained when the steam flow meter was first installed while Figure 3 shows the cooking plan worked out after quite a bit of experimentation.

It can be noted that in this case a twelve hour chart is used as that is the approximate length of each cook, so that all the information pertaining to that cook is entirely separated from the others.

Referring to Figure 3 the dotted line is drawn on the chart by the operator from a template furnished by the plant engineers and indicates the operation desired. The full line is the steam flow record which coincides very closely with the desired operation.

The digester pressure and temperature should also be recorded and may be combined with the steam flow record depending on the type of meter purchased, Such a combination correlates all items involved in cooking as the rate of

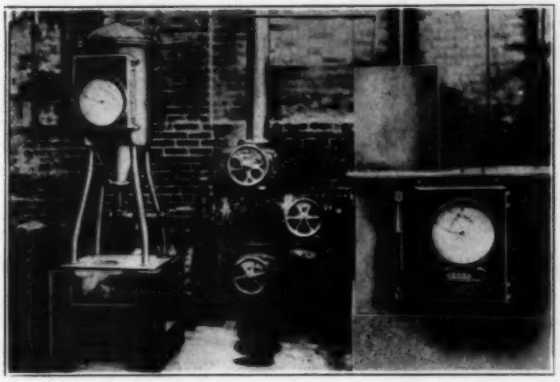


Figure 5

temperature and pressure change can be more readily noted in comparison to the rate of steam admission.

A temperature recorder will not show a true temperature because of the great mass of pulp in the digester but will give a relative reading and show the rate of temperature increase which is highly desirable.

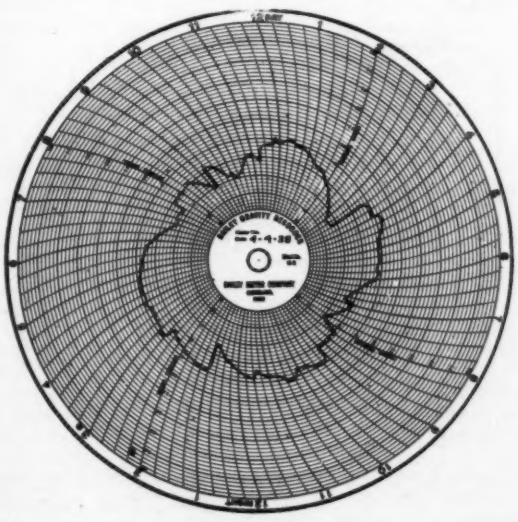


Figure 6

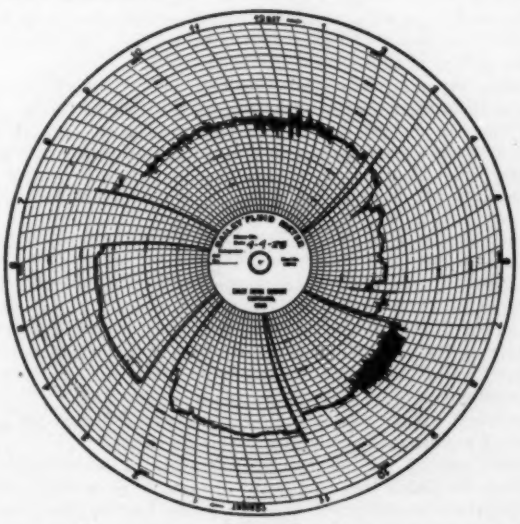


Figure 7

Figure 4 is a chart taken from a meter measuring steam to a group of digesters showing a good distribution of load to permit economical operation of boiler equipment by eliminating excessive peaks as much as possible. The temperature and pressure of the steam should also be recorded and may

or may not be incorporated in the same meter as desired.

Proceeding through the system a meter for the measurement of wash water is found, which should be recording and integrating in order that the total flow of water consumed and the time involved is washing be known as an excess of water increased steam consumption by the evaporators and a deficiency of water means that all the caustic is not removed from the pulp.

RECOVERY DEP'T. MONTHLY STATEMENT

AUG. 1928

GAL. COOKING LIQUID USED	2,700,000 (FLUID METER OR LIQUID LEVEL GAGE)	
LBS. PER GAL. Na_2CO_3	1.3	
TOTAL LBS. Na_2CO_3 USED	3,510,000	
GAL. BLACK LIQUOR TO EVAP	5,015,000 (WEIR METER)	
LBS. PER GAL. Na_2CO_3	.65 (GRAVITY RECORDER)	
TOTAL LBS. Na_2CO_3 TO EVAPORATOR	3,259,750	
TOTAL LBS. Na_2CO_3 RECOVERED	3,000,000 (WEIR METER & GRAVITY RECORDER)	
LOST DURING RECOVERY + CAUSTICIZING	259,750	7.40%
TOTAL Na_2CO_3 USED	3,510,000	
" " TO EVAPORATORS	3,259,750	
LOST DURING COOKING + WASHING	250,250 =	7.13%
RECOVERY	100.00 − (7.40 + 7.13) =	85.47%

Table 1

The combined waste liquor and wash water are then passed through a gravity recorder and a weir meter on the way to the evaporator. Thus a record of the specific gravity and the quantity of the black liquor is obtained enabling the evaporator operators to regulate the steam to the evaporators so as to maintain the gravity of the liquor delivered to the rotary furnaces at the standard desired.

Figure 5 shows an installation such as that just described, the gravity recorded being shown at the left and the weir meter at the right.

Chart reproductions from such a gravity recorder and weir meter are shown as Figures 6 and 7 respectively. By reference to Figure 6, it may be noted that dips in the record denoting a decrease in gravity immediately indicates to the operators that more steam will be required for the evaporators in order to maintain the proper concentration at the evaporator outlet.

The same dips in gravity also show the excess use of wash water for the pulp in the wash pans or diffusers, thereby maintaining a constant check on the operation at that point.

Following this the measurement of steam to the evaporators is highly desireable for the purpose of calculating costs and the use of pressure and temperature recorders on each effect of the evaporators is necessary for determining their efficiency.

In some plants also the flow of steam for storage tank heating is measured.

With regard to the rotary furnaces, or whatever type furnace is used, the equipment desirable is a CO_2 and a temperature recorder for the flue gases leaving the furnace and an indicating draft gauge having the proper ranges.

The quantity of water used in the leach tanks should be determined by a suitable flow meter.

The next point of application of primary importance is that of a gravity recorder and weir meter on the green liquor line to the causticizing department. Such an installation gives the operators in the causticizing department the information needed for the proper addition of soda to obtain the desired quality of finished cooking liquor.

Also the information obtained from this installation used in conjunction with that from the similar installation at the inlet to the evaporators and the quantity of liquor supplied to the digesters gives everything necessary for the calculation of soda recovery in the plant with exception of the Na_2Co_3 added in the causticizing department, as well as definitely establishing the percentage loss in each department.

Table 1 is the monthy statement of the recovery department of a soda mill employing the combination of gravity recorders and weir meters just explained.

Examination of this table will show that the data desired for recovery calculations is easily and directly obtained from the meter equipment as the only indirect calculation involved is that of obtaining the amount of sodium carbonate in the cooking liquor.

In some plants the combination of weir meter and specific gravity recorder is installed at the evaporator outlet in order to insure obtaining the desired gravity of the heavy liquor at the furnaces for proper burning and the installation on the green liquor to the causticizing department omitted.

Local conditions may make that the more desirable installation but the author feels that the combination as shown is generally better when considering both operating and cost allocating information.

The remaining complement of equipment for the soda mill should consist primarily of a steam flow meter for measurement of steam to the agitators in the causticizing department and temperature recorders for each agitator in order to obtain proper control of the boiling period.

Considering the other methods of pulp manufacture, the sulphate and kraft system are so near the same as the soda process that they will not be considered further.

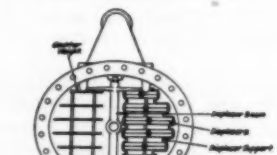
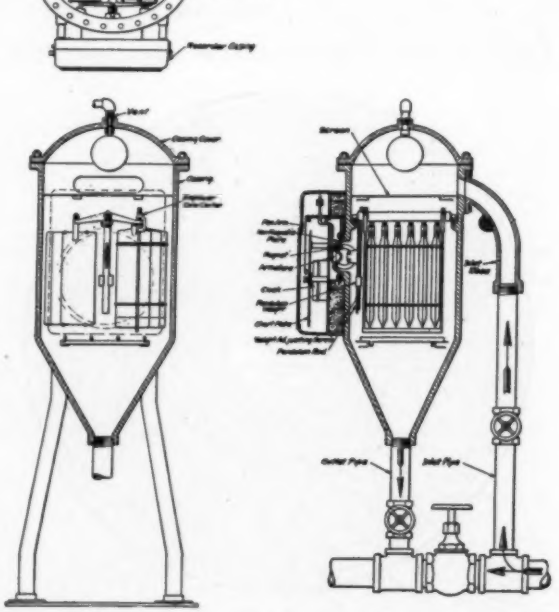


Figure 10



In the suphite process the digester equipment should be the same as for the soda process.

Sulphur dioxide recorders are obtainable for the sulphur burners and gas meters for measurement of sulphur dioxide gas flow to the absorption towers, as well as the relief gas from the digesters.

Sulphur should be burned to obtain the maximum sulphur dioxide, normally about 15 per cent, with a minimum amount of air in order to prevent the formation of sulphuric acid in the coolers and eliminate the presence of sublimed sulphur, which makes the SO_2 recorder worth while.

The flow of water to the coolers and the temperature of the exit gas should be recorded as the rate of cooling of the

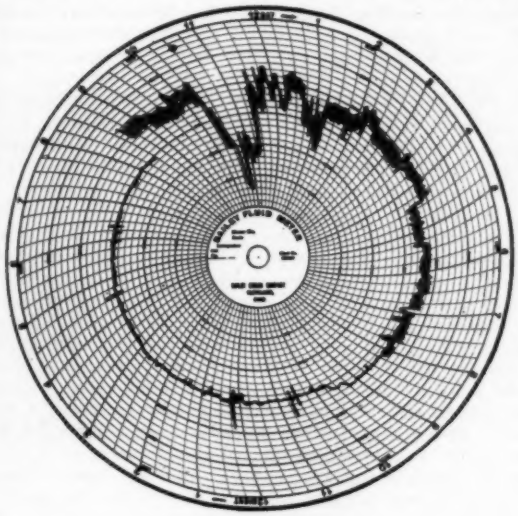


Figure 8

gases has a decided effect on the formation of sulphuric acid in the cooler, it being desirable to reduce the temperature of the gas as fast as possible through the range of temperature where acid easily forms.

By recording the flow and temperature of gas and water to the absorption tanks or towers, it is possible to regulate the strength of the acid produced, although the temperature in the tower has a greater effect on the quality in that it is the governing factor of the amount of available acid in the liquor, so that a very desirable feature is the control of temperature of water and gas in order to produce the desired strength acid from day to day. Should it be possible to control properly the items of flow and temperature a specific gravity recorder would give a check on the acid strength. If such control is impossible, the gravity recorder would not give the information desired as specific gravity is not an exact indication of acid strength.

Groundwood Pulp Mill

In the ground wood pulp mill the use of a temperature recorder on each grinder is very important as too high a temperature will be detrimental to both the stock and the grinder. The remaining meters and instruments would be in general the same as applied to the equipment in the preceding processes that is common to the ground wood mill.

In the bleaching department of the mill the nature of the process determines the need for equipment.

There is, of course, the need for measurement of steam to the department and for temperature recorders where a liquid bleach is employed. Control of temperature is vital in order to keep the liquid from attacking the cellulose and increasing the consumption of bleach excessively if it is too high and still it should be high enough to carry out the process in as short a time as possible.

Should a continuous tank system be employed for bleaching, a specific gravity recorder for the bleaching liquor, as well as meters for the flow of liquor and stock are highly desirable to help carry out the process economically.

At the present time, meters for the measurement of pulp stock are not available as far as the writer's knowledge is concerned. Quite a bit of experimental work has been done toward the design of such a meter. The results obtained were however, unsatisfactory, because of change in the pulp consistency.

It is possible that experimentation will be resumed in the future if it is felt there is sufficient demand for a meter of this type.

In proceeding from the pulp mill to the paper mill, we find much more simple applications of meters and instruments but they are just as important from an operating standpoint.

The Paper Mill

The primary installations are made on the paper machine, although it is highly desirable to measure the steam consumption in the beater room, finish room, size plant, etc., for the purpose of properly dividing production costs.

In case the paper machine is engine or turbine driven the steam consumption should be known.

Also a record of steam flow for drying is very valuable in that as the drying felts become dirty and need cleaning or renewing the consumption of steam for proper drying will be greatly increased.

Similarly, if the proper pressure is not maintained on the press rolls at the wet end of the machine an excess of water has to be evaporated with an attendant excessive steam consumption. Incidentally, such a meter will also show paper breaks on the machine.

In the case of an engine or turbine drive, where the exhaust steam is used for drying with a live steam make-up, the admission of which is controlled by a temperature regulator, a steam flow meter is very desirable on the make-up line for the purpose of checking the regulator operation, as well as for obtaining the quantity used.

As an example of the value of a meter for drying steam, the chart reproduction shown as Figure 8 illustrates an installation that paid for itself easily in a far different manner than covered above.

In this case the paper machine was driven by a steam turbine, most of the drying being done by exhaust steam from the turbine, A great deal of trouble was experienced in the operation of the machine as it was impossible to obtain a uniform quality of paper.

Irregularities in the steam flow record as shown between 8:35 A. M. and 8:10 P. M. were investigated and found to coincide with the dumping of a large steam trap.

Because of the incorrect manipulation of valves in the lines to the trap, high pressure stream from a point ahead of the

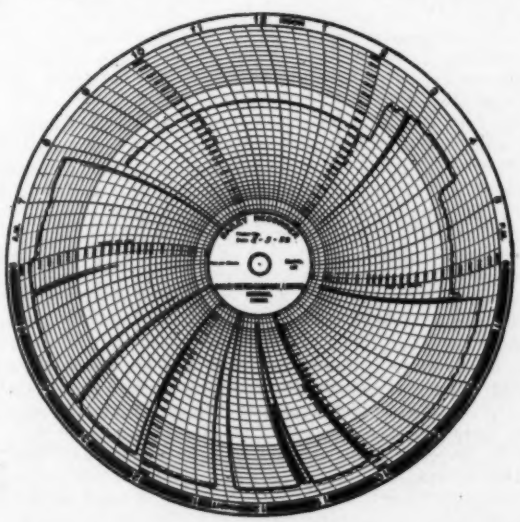


Figure 9

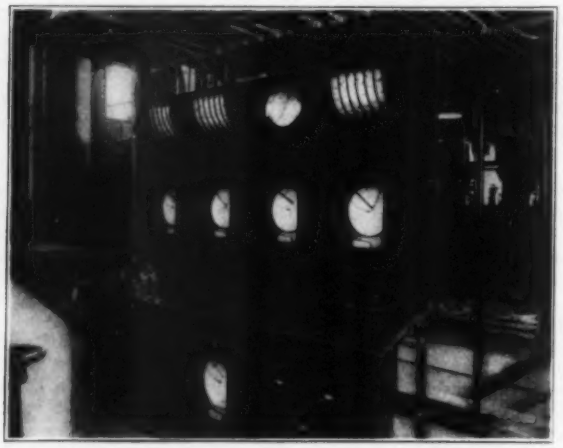
turbine nozzle was being fed to the trap. This, of course, caused a change in turbine speed every time the trap dumped resulting in the production of a non-uniform quality paper.

Such a condition would undoubtedly have gone undetected for some time had it not been possible to correlate the meter readings with the trap dumping thereby giving the operators a clue.

Another very important item is the use of a recording tachometer on the paper machine as it primarily eliminates one of three variables encountered in obtaining a certain weight of paper, namely, speed, quantity of stock and quantity of water.

It is highly desirable to operate at the highest speed possible in obtaining the weight of paper desired as doing so means the maximum production for the equipment. This maximum speed may be determined by increasing the speed of the machine each time a paper of a given weight is being run until the speed gets to the point where the back pressure on the machine is too high or evaporation incomplete. It is then known that a speed slightly lower is the one to use.

Having determined this, the next time the same paper is run the operator immediately obtains that speed and in a



Meter panel serving three 1057 h.p. boilers in plant of Mead Pulp and Paper Co., Chillicothe, Ohio

few minutes has adjusted the stock and water so that the correct weight of paper is being obtained.

This is of great importance in those mills where comparatively small quantities of papar of a given weight are produced at a time as the amount of waste obtained while making preliminary adjustments before obtaining the correct weight may easily become a large percentage of the total output thus putting a lot of unnecessary overhead on the machine.

The use of a recording tachometer in a job lot mill is well illustrated in Figure 9. From 8:00 A. M. until 2:15 P. M. with a speed of approximately 280-feet per minute a paper with a base weight of 56-pounds was being run. The base weight in this case is the weight of 500-sheets measuring 25-inches by 38-inches. From 2:15 to 4:15 a 45-pound paper was being obtained at a speed of about 330-feet per minute. From 4:15 to 6:30 P. M. they were running a 50-pound paper while from 6:30 P. M. until 8:00 A. M. a 33-pound paper was being made at a speed of 345-feet per minute.

It often times requires the operator an hour when unguided to properly adjust the speed, stock and water so that for the 45 and 50-pound papers the loss could have easily been 30-per cent of the total produced.

Such an installation has in one case increased the production of the machine 50-per cent, while at the same time the operators work has been decreased and complaints about the weight of the paper practically entirely eliminated.

Another type of information available is the recording of breaks in the paper, when the tachometer is driven by the spring roll as evidenced on the chart by dips in the record to the zero line or approximately there and of machine outage for any reason. Between 12:16 and 12:40 at night it was necessary to shut down the machine to wash a dirty felt on the wet end.

When a tachometer is installed on a machine making very light weight paper, the spring roll is not used so that it must be driven by a felt roll. This method of driving shows the machine speed but records breaks differently, the breaks being shown by a recorded increase in speed.

The measurement of "white water" has become a highly important item in recent years in connection with various "save all" systems for the elimination of an important loss.

This measurement does not need to be extremely accurate as a relative reading from day to day is sufficient. Accordingly most plants have installed a liquid level recorder in conjunction with a rectangular weir which gives a very good check on the recovery of pulp obtained.

Also in connection with the paper machine a combined vacuum and pressure recorder for the back pressure header is essential and temperature controllers with recorders for the drying rolls are commonly installed, while many mills have a temperature recorder on the return trap system for each machine.

It is believed that the foregoing has covered the most important items of meter and instrument equipment although there are many applications which would be determined by local conditions and quite a few of general application that have not been mentioned such as the measurement of water to the wood room, the intermediate wash tanks in a sulphite mill, to knotter screens, and centrifugal screens; of steam to the wood room, size plant and finishing room; of liquid level in the various stock chests; humidity recorders for the machine room; and of other items dependent upon the character of the equipment in the individual plant.

Of the various types of meters and recorders mentioned, all are available in some form or other with the exception of the pulp stock meter mentioned before.

Meters for boilers, steam, and water, and temperature and pressure instruments are well known and need no description, but we would like to call to your attention a type of specific gravity recorder that has been successfully used, which is illustrated by Fig. 10.

The physical appearance of the recorder is shown in Figure 5 while Figure 10 presents cross-sectional views showing the working parts.

It consists of a flexible displacer filled with liquid having the same coefficient of expansion as the flowing liquid, and a counterweight suspended on a pivot points from a beam supported on pivots at its center inside a cast iron case. One end of the beam carries a pendulum arm to which is attached a magnet.

The liquid being tested is caused to flow through the casing which causes the displacer and counterweight to assume a position corresponding to the gravity of the flowing liquid.

The resultant travel of the magnet causes a small armature mounted on pivot points and connected to the recording pen to take a corresponding position.

The principle of the recorder is identical with that of a Westphal balance and when properly constructed should be more accurate, as the error of taking samples and subsequently testing them are eliminated.

It is hoped that the foregoing will be of value to those interested in the economical operation of pulp and paper mills, and we firmly believe that there are possible applications of equipment of this nature other than those mentioned, which would prove beneficial to the operators, and which will ultimately be made as improvements are made in the various processes and types of major equipment involved.

The Moore Steam Turbine Co., Wellsville, N. Y., recently replaced a single stage turbine at the plant of the St. Regis Paper Co. at Deferiet, N. Y. with a 9 stage turbine. The single stage turbine was driving a paper machine and was mechanically perfect, but on account of the reduced steam consumption of the 9 stage turbine, it was purchased in order to get the required heat balance. The cost of the turbine and installation was in the neighborhood of $3,000, and it is estimated the saving in steam cost alone will be approximately $6,700 a year.

Technical Control in Soda Pulp Mills*

By E. S. HINMAN
P. H. Glatfelter Co., Spring Grove, Pa.

DURING the past several years, the tendency has been in the pulp and paper industry to get away from the more expensive rule of thumb methods, and in their place firmly establish the principles of technical control in the operations of each department as a unit, and the whole industry as an aggregate.

What is the object of technical control, in the soda pulp mill, or in fact any pulp mill, whether it be soda, sulphite, sulphate or mechanical pulp which is being made?

The answer to this question is first of all, a more uniform product; secondly, more economical operations, and lastly, reducing the cost of production to the minimum figures. The last statement is the most important, for upon this depends the managements desire to manufacture a product which will show them a profit on their investment. To do this, it is not necessary for the management to maintain an elaborate technical staff and department, but the man in charge may be either the superintendent, chemical engineer or chemist. Whoever the man may be, he must know the answers to the three questions which follow: "What is to be done; How is it to be accomplished, and Why is it done?"

Technical control is only the intelligent adherence to certain definite standards in the various operations. These standards are not universal, and is illustrated by the fact that there is not any recognized method of technical control. But each mill presents its own particular problems, which must be handled differently from the problems of other mills.

The predetermined method of operation may be insured by personal inspection, by the use of graphs, reports and charts, which should be checked by the person in charge of technical control, to see that the various standard methods are being maintained.

It is not only the duty of the person in charge of this work to see that each department produces material of standard quality, but also to see that the various raw materials used conform to their particular specifications.

For the sake of convenience let us divide the soda pulp mill into two components, namely, that part which converts the log into chips and thence to pulp, ready to be lapped, or sent to the paper mill in the form of bleached slush stock, and that part which recovers the soda in the caustic liquor with which the wood is digested.

In the manufacture of pulp by the soda process, the woods used are classified broadly into two main divisions, namely, those species containing coniferous fibers, such as jack pine, hemlock, etc., and those species containing broad leafed fibers, such as popular, aspen, birch, etc. The latter group are the principal woods used in making soda pulp.

The presentation of this subject will be confined to general statements of control in the various departments, starting with the wood room and following the log through the process.

Wood Room

The controlling factors in the wood room are as follows:

1—Well seasoned wood, free from bark and dirt
2—Moisture content
3—Size of chips, depending upon
  (a) quality of knives
  (b) conditions of knives
  (c) bevel of knives
  (d) distance between cutting edge of knives and face plate
  (e) condition of bed plate
  (f) speed of chipper
  (g) space in spout occupied by logs

Digesters

By controlling the following factors, the proper yield and bleach consumption figures may be maintained.

1—Condition of wood
  (a) well seasoned
  (b) green
  (c) partially rotten
2—Total pounds caustic soda, varied with
  (a) condition of wood
  (b) Causticity of cooking liquor
2—Uniform steam pressure
4—Time of cooking
5—Time consumed in raising digester to full pressure
6—Relief of gases from digester
7—Blowing pressure
8—Condition of circulating and steam pipes if direct cooking is used
9—Condition of false bottoms
10—Percentage of black liquor added to digester; based on total volume
11—Temperature in digester

Items 3, 4, 5, 6, 7, 8 and 9 may be controlled by using recording pressure gauges.

Item No. 11 by using recording thermometers.

Wash Pans or Diffusers

In this department, thorough and efficient washing of pulp is desired not only to reduce bleach consumption but to produce a black liquor as strong as possible, and to reduce fiber losses to the minimum. To do so the following must be controlled:

1—Condition of pan false bottom, if pans are used
2—Method of washing stock
3—Removal of finely suspended pulp and liquor

At this point, it is good practice to save samples of liquor from each pan, when liquor is turned from strong to weak tank, and from weak tank to sewer. This will ascertain whether or not every blow has been handled under standard conditions thereby determining loss of soda and unnecessary expense of subsequent evaporation by too high a dilution of the liquor.

Table showing 48% soda remaining in stock at different strengths, using pans 6 ft. deep. Area of pan = 75 sq. ft.

Strength of black liquor	Soda remaining
4° Bé at 60° F.	400 lbs.
3½° Bé at 60° F.	320 lbs.
3° Bé at 60° F.	250 lbs.
2½° Bé at 60° F.	185 lbs.
2° Bé at 60° F.	130 lbs.
1½° Bé at 60° F.	85 lbs.
1¼° Bé at 60° F.	65 lbs.
1° Bé at 60° F.	45 lbs.

FORMULA TO DETERMINE YIELD

$$Y = \frac{A \times B \times C}{D}$$

A = Area of pan in sq. ft.
B = Average depth of stock in pan
C = Air dry wt. in grams of 1 cu. ft. stock
D = Grams equivalent to 1 lb.
Y = Yield in lbs. of air dry pulp

Percentage Yield

$$\frac{Y}{X} = P$$

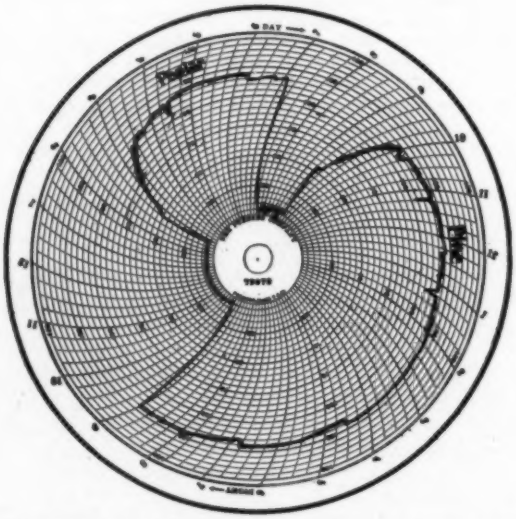
Y = Yield in lbs. air dry pulp
X = Weight of wood in digester
P = Percentage yield

*Read at the fall meeting of the Technical Association of the Pulp and Paper Industry, Wausau, Wis., September 27, 1928.

Screening

Producing a clean stock is the object of this operation, and this may be accomplished as follows:

1—Speed at knotter
2—Consistency at knotter
  (a) feed
  (b) discharge



Actual operating chart from digester recording pressure gauge. Shows cook on both Poplar and Pine pulpwood

3—Type of screens
  (a) Revolving
    1—Speed of machine
    2—Consistency of
      (a) feed
      (b) discharge
    3—Condition of springs and knockers
    4—Size of perferation
    5—Condition of tailing screen
  (b) Flat
    1—Cut of plates
    2—Condition of diaphrams
    3—Condition of Springs and Knockers

4—Consistency of
  (a) feed
  (b) discharge

Personal inspection of these machines should be periodical.

Bleaching

Reducing fiber losses, oxidizing the impurities in the screened stock, and at the same time maintaining the maximum strength and producing the desired color, are the objects of this operation. They may be accomplished as follows:

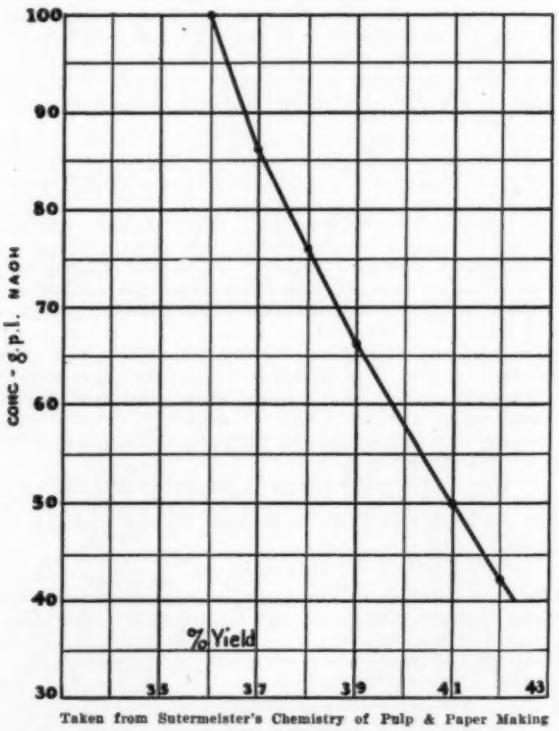
1—Check fiber losses from brown stock thickeners
2—Density to bleachers
3—Bleach requirement test
4—Titration of sample of calcium hypochlorite solution to determine available chlorine content
5—Temperature of stock
  (a) regulated by recording thermometer
6—Fiber losses from washing bleached stock
7—Thorough washing of bleached stock to free pulp from residual impurities
8—Qualitative test for traces of bleach in stock

Preparation of Calcium Hypochlorite

In the preparation of calcium hypochlorite used for bleaching the pulp, losses may be reduced and efficient operating results may be obtained by the following methods:

1—The physical and chemical qualities of the hydrated lime if bought as such or of the chemical lime of the lime is slacked at the plant

Soda Pulp Yield Curve



Taken from Sutermeister's Chemistry of Pulp & Paper Making

2—A clean absorption tower, if tower is used
3—Maintainance of predetermined strength of bleaching solution by actual titration
4—Proper settling time
5—Rate of chlorination to produce
  (a) alkaline end point to batch
6—Clear strong liquor sent to bleachers
7—Washing sludge at least twice
8—Reuse of wash water
9—Chlorination temperature
10—Maintainance of reports, recording perpetual check on losses

PREPARATION OF CALCIUM HYPOCHLORITE

Table showing amounts of lime used depending upon its quality.

Quality	lbs. lime	gals. absorbed	Strength
Inferior lime 67% Ca O	4900	18,400	25.5 g.p.l.
Good lime 73% Ca O	4550	18,400	26.0 g.p.l.

Table showing sludge losses using one and two washes on sludge.

Remaining after 1st wash	Sludge losses
40.75 lbs. avail. Cl_2	1.07%
63.10 lbs. avail. Cl_2	1.65%
78.50 lbs. avail. Cl_2	2.06%
Remaining after 2nd wash	**Sludge losses**
14.60 lbs. avail. Cl_2	0.38%
30.80 lbs. avail. Cl_2	0.80%
23.85 lbs. avail. Cl_2	0.60%

Evaporators

The controlling factors in this operation are as follows:

1—Highest possible test black liquor
2—Highest possible temperature black liquor
3—Maximum volume to each machine
4—Measurement of volumes fed and discharged from machine
5—Steam consumption
6—Periodical testing of feed and discharge liquors, with proper recording of same
7—Care in starting and shut downs, so minimum losses result
8—Periodical cleansing of feed pipes
9—Entrainment losses
10—Proper vacuum

The best possible liquor should be produced, for on this operation depends the success or failure of the recovery process.

Furnace or Incinerator Room

Quality of recovered ash is important and may be secured as follows:

1—Proper density of black liquor
2—Amount of draft
3—Stack losses
4—Speed of rotary
5—Condition of lining
6—Position of burned ash, inside rotary
7—Proper firing of jumbo
8—Physical character of recovered ash

Causticizing Operation

Upon the proper maintenance of caustic percentage depends the quality of the pulp produced. This operation is controlled by these factors:

1—Leeching of ash
2—Use of ash as recovered
3—Lime of standard specifications
4—Temperature of liquor before lime is added
5—Proper agitation
6—Sufficient time for chemical reaction to be complete
7—Strength of solution, using either
  (a) Sp. Gr. or
  (b) degrees Baume scale
8—Proper boiling of solution
9—Type of continuous equipment used

Filtration and Dilution of Caustic Liquor

The efficiency of this department depends upon the following:

1—Type of filter used
  (a) pressure
  (b) vacuum
2—Thickness and uniformity of cake
3—Easy passage of liquor through cake
4—Condition of filters
5—Maintenance of predetermined strength
6—Ample settling time
7—Temperature of liquor
8—Washing of sludge
9—Reuse of wash water
10—Sludge disposal
11—Analysis of liquor

Technical control in the soda pulp mill should include in its scope not only the aforementioned principles but should also keep a careful check on all losses in each department and the pulp mill in general.

Only by watching the smallest details will technical control be of financial value to the organization.

TABLE FOR USE OF BLACK LIQUOR IN DIGESTERS

% of total volume is black liquor	Increase in bleach consumption
8% black liquor	8.4% to 10.1%
17% black liquor	8.4% to 14.1%
Using 100% black liquor, and solid NaOH to bring reading to correct strength	8.4% to 22%

Taken from Sutermeister's Chemistry of Pulp and Paper Making

The Semi-Sulphite Process*

1.--Preliminary Studies

By C. C. HERITAGE,[1] C. E. CURRAN,[2] W. H. MONSSON[3] and G. H. CHIDESTER[4]

DURING the past five years, the Forest Products Laboratory has conducted investigations on the modification of existing standard pulping processes in order to secure increased yields of pulp without material sacrifice of pulp quality. As a premise from which to reason, it seems a somewhat questionable practice that considerable care should be taken to produce pulps of high cellulose content when, for the larger-tonnage lower-grade uses, they are immediately mixed with large quantities of the original wood substance, namely, groundwood pulp. Likewise, it seems quite possible to make, by proper fiber-processing methods, high-yield chemical pulps that are fully equal or are even superior to high-cellulose pulps in the physical properties necessary, from the standpoint of use requirements, in certain grades of finished paper.

Although the principal objective of these investigations, as far as the Laboratory is concerned, has been improved utilization of the pulp wood at the mill and hence increased timber reserves, secondary objectives have been the lowering of manufacturing costs and the improvement of stream conditions by decreasing the waste liquor to be disposed of.

These investigations resulted first in the development of the semi-kraft[5] and later the semi-chemical processes[6]. More recently a series of exploratory digestions, based upon modifications of the commercial "quick-cook" sulphite process, have been made. The purpose of this paper is to report upon this exploratory work. In accordance with nomenclature previously chosen, this mild sulphite pulping process is referred to herein as the semi-sulphite process.

Semi-Sulphite Process

The semi-sulphite process as developed at the Forest Products Laboratory consists of a mild pulping action employing the usual constituents of sulphite cooking liquor but so regulating the conditions of temperature, time, concentration, and ratio of acid to chips that the chips, although thoroughly impregnated, are only softened and thus retain their original form, at the end of the reaction, to a large extent. The softened chips are "blown" from the digester in the customary way, are thoroughly washed, preferably with warm water, and are then mechanically disintegrated to a true pulp by suitable equipment. For this purpose, the rod mill has been found satisfactory, although other types of refining equipment can possibly be used as well.

Results obtained with the refined pulp indicate that it can be substituted, pound for pound, for the sulphite pulp now being used in newsprint and wrapper manufacture, without affecting the quality of the final product.

In the preliminary study recently concluded, satisfactory pulp was obtained from white spruce, with yields of softened chips varying from 63 to 75 per cent by weight on an oven-

*Read at the fall meeting of the Technical Association of the Pulp and Paper Industry, Wausau, Wis., Sept. 27, 1928.

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[5]Paper Trade J. 80, No. 11, 55-57 (1925).

[6]Paper Trade J. 83, No. 13, 50-53 (1926).

dry basis; the amount of yield depended on the severity of the softening conditions employed. Exploratory digestions were made employing eastern hemlock, jack pine, and loblolly pine with resultant yields varying from 56 to 73 per cent; the yields likewise depended on the condition employed.

Cooking acid and cooking schedules—The cooking liquor was prepared in the usual manner, described in previous sulphite publications of the Labatory[7], using liquid sulphur dioxide and hydrated lime.

Acid concentrations varying from 3.55 per cent to 5.5 per cent total sulphur dioxide content, of which 0.85 per cent to 1.2 per cent was in the form of combined sulphur dioxide, were used. The semi-commercial sulphite digester that has been described previously[8] was employed.

The temperature schedules followed were practically identical in type throughout the study. One and one-half to two hours were employed as the impregnation period in bringing the temperature of the digester to 110°C. At this point a different but still uniform rate of temperature rise was begun; it was selected to give a maximum temperature of 132° C. to 136°C. in 5.5 to 7 hours total time. The relief was so regulated during the process as to maintain a pressure of 75 pounds per square inch, with a uniform relief period at the end of the digestion.

Yield determination—The yield of softened chips was determined by pressing out the excess wash water, using a hydraulic press, and then weighing the pressed chips and sampling them for moisture.

Characteristics of the Development of Strength—Fiber strength was developed in the softened chips by the standard Laboratory ball-milling method. Hand sheets were prepared from pulps treated for various lengths of time, such as 20, 40, 80, 120 and 160 minutes, and were tested. The pulps reached their maximum bursting strength of 1.0 to 1.2 points per pound per ream in 60 to 120 minutes. Maximum folding strengths for the spruce and hemlock pulps were approximately 400 double folds. Maximum tearing strength developed prior to 40 minutes milling, reaching values of 1.5 to 2.2 grams per pound per ream.

The strength characteristics of semi-sulphite pulp compare favorably with commercial grades of news sulphite pulps that have been evaluated at the Laboratory during the past years.

Rod-milling treatment of softened chips—As mentioned previously, the disintegration of the softened chips was carried out in a semi-commercial rod mill.[9] Earlier experiments using the rod mill as a disintegrator had shown that excellent results can be obtained on semi-chemical chips at a consistence of 8 per cent. Accordingly, the perliminary milling studies here were made, operating batchwise, at 8 per cent consistence. The batchwise method of reducing the chips to pulp was used in preference to the continuous so that milling conditions could be regulated more closely.

The time of milling was varied from 15 to 45 minutes. From the results obtained the optimum milling time appears to be from 30 to 45 minutes. The milled pulp was brushed lightly in the beater in admixture with groundwood and the resulting stuff was refined in the Jordan.

Experiments in Paper-Making—Since the product of largest tonnage in which semi-sulphite pulp may find use is newsprint practically all paper-making experiments were confined to duplicating commercial newsprint quality.

Runs on the paper machine were made using various proportions of rod-milled stock and of commercial spruce groundwood. Satisfactory sheets of newsprint were made on the Fourdrinier machine using a furnish of 25 per cent spruce semi-sulphite pulp and 75 per cent spruce groundwood pulp. The sheets were judged on the basis of bursting, folding, tearing, and tensile strengths, and color. Hemlock gave results equally good, and even jack pine appeared promising. The tearing strength was the only physical property measured that was not fully equal to average commercial print. Further studies of fiber processing may show the way to improve this property.

Power consumption for milling—The power consumed in producing semi-sulphite pulp will vary with the mildness of the cooking and the type of pulp desired. In comparing the power consumption of the experimental rod mill, running batchwise, with that of a commercial mill (6 feet in diameter by 12 feet long) running continuously, it has been found that continuous operation requires roughly about twice the milling time of batchwise, and the large mill requires about one-

[7]Paper Trade J. **86**, No. 12, 59-62 (1928).
[8]Paper Trade J. **74**, No. 15, 295-305 (1923).
[9]Paper Trade J. **83**, No. 12, 53-54 (1926); **83**, No. 24, 43-44 (1926).

Table 1.

Cooking conditions and yield data of a typical cook.

Species of wood	Acid composition			Oven-dry weight of chips	Volume of cooking acid added	Duration of cook	Time to 110° C.	Maximum temperature[1]	Yield of softened chips—basis oven-dry weight of wood
	Total SO_2	Free SO_2	Combined SO_2						
	Per cent	Per cent	Per cent	Pounds	Gallons	Hours	Hours	°C.	Per cent
White spruce	3.55	2.70	0.85	75.2	47	6	2	132	75.5

[1]A uniform rate of temperature increase was used from 110° C. to the maximum value, and a maximum pressure of 75 pounds gauge was employed.

Table 2.

Energy consumed in refining semi-sulphite pulp, beater furnish, and physical properties of machine-made paper (newsprint).

Milling time	Unit energy consumption		Rate of milling per 24 hours based on a commercial 6′ x 12′ mill	Beater furnish[1]		Time of pulp in beater[2]	Physical properties of finished paper			
	3′ x 5′ mill batchwise	6′ x 12′ mill continuous		Semi-sulphite pulp	Spruce groundwood pulp		Wt. per ream of 24x36x500	Thickness	Bursting strength factor	Tearing strength factor
Minutes	H.P. days per ton	H.P. days per ton	Tons	Per cent	Per cent	Minutes	Pounds	Inches	Pts./lb./ream	Gr./lb./ream
45	23.6	15.7	6.4	25	75	15	32.8 32.0[3]	0.0032 0.0036[3]	0.39 0.28[3]	0.72 0.74[3]

[1]Size, alum, clay, and dye-stuff added.
[2]For mixing only.
[3]Average values for 18 samples of North American commercial newsprint.

third the energy consumption per ton of the experimental one. As an example of the power consumed for disintegration of the softened chips in the experimental rod mill, 12.1 horsepower-days were required for milling 0.6 ton of spruce chips, which is 20.2 horsepower-days per ton. On a commercial scale it is estimated that a power consumption of $\frac{20.2 \times 2}{3}$, or 13.5 horsepower-days per ton would be required.

The complete data for one typical cook, including pulping, milling, and paper making, are given in Tables 1 and 2.

Conclusions

From the results of this explanatory work, the following conclusions may be drawn: (1) The semi-sulphite process appears to offer a means by which a high yield of pulp suitable for newsprint and other grades of coarse paper can certainly be obtained from spruce and hemlock, possibly from hardwoods and mixtures, and perhaps from some of the more resinous species such as jack pine. (2) The yields obtained can be varied at will from 25 to 50 per cent in excess of present mill practice. (3) A considerable saving can be effected in the time required for cooking. (4) A maximum bursting strength of a point per pound per ream or more can be obtained for the pulp. (5) Screenings can be elminated, since the total digester charge is utilized. (6) Approximate cost estimates indicate an ample margin of saving over the additional power and fixed charges incurred by rod milling. (7) Difficulty in discharging the digester by its own internal pressure would probably develop at yields above 60 to 65 per cent. The recent trend in mill construction toward the employment of gravity discharge after complete release of pressure appears to meet such a difficulty. (8) The field of semi-sulphite pulping presents an exceptional opportunity to accomplish a number of desirable ends by one means; hence it will continue under active investigation at this Laboratory.

Fall Meeting of Paperboard Industries Ass'n

Members of the Paperboard Industries Association met at the Palmer House, Chicago, September 19 and 20 in group and general sessions.

General Session—The general meeting of the association, attended by members of the three groups was held the afternoon of September 20th, and was presided over by H. S. Hinkle in the absence of President W. J. Alford, Jr. The report of the executive committee was given and covered all of the subjects under consideration by the association. The special committee appointed at the July, 1928, meeting to consider the subject of trade practice conference before the Federal Trade Commission reported that tentative resolutions had been drafted which it recommended be submitted to the Federal Trade Commission for adoption. Copies of the draft of the resolutions as revised and adopted by the members in session, were mailed to all absent members with a request for their vote.

Irving Hill, of the Lawrence Paper Mfg. Co., Lawrence, Kans., was appointed to attend the annual conference of the Chamber of Commerce of the United States, at Hot Springs, Ark., Oct. 8-9, 1928, as the official representative of the Paperboard Industries Ass'n.

Folding Box Group—The sales promotion committee reported on the work being carried on to inaugurate or increase the use of folding boxes. The report covered three specific articles, for the packaging of which the use of folding boxes is being substantially increased. In connection with this report, there was a discussion on a new form of competition for the folding box. A further study of this subject is to be made.

A letter from the Treasury Department was read advising the association that the schedule of depreciation rates recommended by the association for use in connection with income tax returns, has been formally approved.

Paperboard Group—This meeting which was presided over by Vice President E. R. Hankins, was well attended. Mr. Whiting, statistician, reported that the recommendations of the Paperboard Group had been transmitted to the Treasury Department, and that several points had been raised which would necessitate further consideration of the recommended schedule. The points of difference were explained and the subject referred to the committee for further handling with the Treasury Dept.

The Department of Commerce has taken up with the association the advisability of taking a yearly census of the industry. The meeting went on record as being in favor of such action.

Container Group—At this session, General Manager Browder reported three changes soon to be authorized in a supplement to the freight classification which will open up substantial additional business to the corrugated and solid fiber shipping container industry. He also reviewed a number of proposed changes in corrugated and solid fiber box specifications, which proposals will be considered by the Consolidated Freight Classification Committee at hearings scheduled for the month of October.

Report was made that the Treasury Department had suggested certain revisions in the association's recommended schedule of rates of depreciation. The matter was referred back to the committee for adjustment.

The members of the different groups were presented with a copy of the 1927 census, and a Booklet of Charts depicting the per cent of running time by months, production per machine hour, etc.

General and group nominating committees were appointed to nominate officers for the election at the Annual Meeting, to be held at the Waldorf-Astoria in New York City, November 21 and 22, 1928.

Waxed Paper Standardization

Paul S. Hanway announces that the American Waxed Paper Association has received from the Department of Commerce its approval of a plan that is calculated to save many thousands of dollars of traveling expense and time in the development of its standardization and simplification program.

Instead of inviting all consumers of bread wrappers and all manufacturers in affiliated industries to attend the standardization and simplification meeting, the Waxed Paper Association proposes that the subject be handled by committees officially appointed or elected by the affiliated industries to meet with a committee from the waxed paper industry. Any differences would be taken up by mail to the members of each group.

Mr. Hanway, manager of the American Waxed Paper Association, has been appointed an associate of the Department of Commerce, to collect and compile data for the waxed paper manufacturers, and in conjunction with Franklin D. Jones, counsel for the association, has initiated this new idea and already has received approval from the Department of Commerce and from the American Baking Association's president, Henry Stude.

It is felt by Mr. Hanway that the subject is one which should interest every group in the paper industry, not only in matters of standardization and simplification, but as a simplified method for arriving at arbitration upon various subjects, not generally understood by affiliated industries. In the furtherance of good relations and co-operation among the industries the new plan is considered likely to be more effective than any hitherto proposed.

International Combustion Buys Boiler Company

International Combustion Eengineering Corporation announces the purchase of the Hedges-Walsh-Weidner Co., of Chattanooga, Tenn., a recent combination of The Casey-Hedges Company and The Walsh & Weidner Boiler Co., two of the oldest and most widely known boiler manufacturing companies in the United States.

With this new company, International Cumbustion acquires a large and general boiler business, and augments its present extensive manufacturing facilities with two of the most modern boiler plants in the country, and makes it possible for them to offer any type of boiler, large or small, now available on the American market.

Paper Mill Safety Congress

Annual Safety Congress Brings Pulp and Paper Mill Safety Engineers to New York in Large Numbers—Prizes Awarded to Mills Having Best Safety Records

THE seventeenth annual Safety Congress was formally opened in the ball room of Hotel Pennsylvania, New York, on Monday morning, October 1, with an invocation by the Rev. Ralph W. Sockman, D. D., followed by an address of welcome on behalf of New York City by Mayor James J. Walker. Then followed an address by Alfred H. Swayne conveying the greetings of the New York Safety Committee. The response to the welcoming addresses was made by President Homer E. Neisz, who also read extracts from his annual address to the Congress, the full text of which was available in print. The minutes of the previous meeting were adopted as read, after which an election for directors was held and Willis H. Booth, president of the Merchants' Association, New York, delivered an address on "The Humanics of Industry." He said that the greatest problem in industry today was that of human relations. The development of conditions in industry under which the individual may contribute the maximum of inventive ingenuity to his task must be the first obligation of the employer if industry is to continue to expand. Homer L. Ferguson, president, Newport News Ship Building and Dry Dock Company, Newport News, Va., also addressed the gathering which numbered nearly 1,000, every seat in the ball room being taken as well as some of the gallery seats.

Sectional meetings were scheduled to take place at noon in all of the five hotels which housed the delegates. The congress was divided up into thirty-five sections and 110 separate meetings were held which were addressed by 342 speakers. It was estimated that 7,000 persons attended the various sections of the Safety Congress, there being 1,500 from the metropolitan area alone.

Meeting of Paper and Pulp Section

The Paper and Pulp Section, of which W. J. Peacock, head of the Department of Personnel, Northern Paper Mills, Green Bay, Wis., is chairman, met at 12:30 o'clock in the sun parlor on the roof of the Waldorf Astoria Hotel, with seventy members present, including regional directors from Massachusetts, New York, Pennsylvania, Wisconsin Valley and Fox River Valley. Alvin Record, supervisor of safety, International Paper Company, Chisholm, Me., and C. E. Torrance, superintendent of plant and personnel, Bryant Paper Company, Kalamazoo, Mich., both of whom are regional directors, were unavoidably absent. A letter from Mr. Record was read at a later session in which he announced a forthcoming regional safety meeting for the State of Maine to be held in the House of Representatives at Augusta on November 15, which would be addressed by Governor Brewster.

Get-Together Luncheon

The opening meeting was preceded by a luncheon which gave members the opportunity to make many pleasant acquaintances. It was a happy thought of Chairman Peacock to call upon the representatives of the various States to arise and stand as the State name was announced. Each member of the group was asked in turn to give his name and mill connection, which served to introduce the entire gathering to each other. One mill in Maine, the St. Croix Paper Company, of Woodland, was represented by six men from different parts of the mill, in addition to L. J. Parant, general manager, and F. L. Irvin, supervisor of employment. The men were there for the purpose of gathering information on organized safety work and bringing back safety ideas to their fellowworkers. Louisiana was represented by W. H. Jennings, safety engineer of the Great Southern Lumber Company and Bogalusa Paper Company, who made a hit by distributing canes of polished yellow pine stamped "Bogalusa Reforestation" with burnt in letters. Wisconsin had a large delegation and there were also many representatives in attendance from mills in Quebec and New Brunswick, Canada, besides Ohio, New York, Pennsylvania and Illinois.

Chairman's Address

The first business taken up was the annual report of the chairman presented by W. J. Peacock in accordance with a recommendation of the National Safety Council that he should this year give an account of the previous activities of the Paper and Pulp Section. He gave a good historical account of the origin and development of the Section, dwelling particularly on what had been accomplished during his own three terms of office, from 1925 to date.

One of the first tasks undertaken by him at the request of the American Academy of Political and Social Science shortly after his election in 1925 was the writing of a chapter on "Safety in the Paper Industry" for **The Annals** of the Academy. The article had to be written rapidly, mostly at night, with revisions by telegraph, for it had to be ready within thirty doys. The work, which involved looking up the early records of the safety movement proved a valuable initiation for him into the history of organized efforts to keep down preventable accidents.

Early Activities

Mr. Peacock gave instances of the activities of the section as far back as 1918 when, under the chairmanship of George E. Williamson, of the Strathmore Paper Company, the News Letter had been employed to stimulate interest in safety work among paper mills. The idea of a safety contest as a method of arousing interest in the safety movement was first proposed by E. P. Gleason, of the Nekoosa-Edwards Paper Company, though it was not until 1926 that great emphasis was placed on the safety contest by the award of trophies.

Source of Accidents

Mr. Peacock confessed that he had been stirred by the discovery that the majority of industrial accidents could be accounted for by the human element rather than machine causes. Starting with the first program and repeatedly thereafter the fact had been emphasized that accidents were due to inexperience, ignorance and other human causes. What the American Engineering Council had finally worked out to a scientific conclusion—that safety and increased production go together—was originally advanced in 1915 by President Henry W. Stokes of the York Haven Paper Company. He mentioned these things to show the kind of leadership the section had had from its organization. The founders of the section were among the organizers of the National Safety Council and contributed to its vision and accomplishments. He deemed the section fortunate in having men like Shattuck, Williamson, Lundrigan, Turner, Costigane, Gleason, Wilson, Altman, and Phillips still with it as pacemakers.

A Significant Year

The Paper and Pulp Section was organized at Philadelphia in 1913, four years after the National Safety Council had come into existence, twenty-five of the thirty persons present at the organization meeting being from eastern companies. S. F. Shattuck, of Kimberly-Clark Company, was the first chairman of the original meeting, the program for which had been arranged by him with the assistance of George E. Williamson, of the Strathmore Paper Company, and R. B. Robertson, of the Champion Fibre Company.

Mr. Peacock quoted interesting details from the records of the section and named the men who were active in its development. The year 1919 was referred to as a significant one in the history of the section, for in that year, under the chairmanship of A. P. Costigane, the drafting of the Paper and Pulp Safety Code was undertaken. The code was completed five years later and was published as Bulletin 410 of the Bureau of Labor Statistics, U. S. Department of Labor, having been approved by the American Engineering Standards Committee. If the section had accomplished nothing else, said Mr. Peacock, the code would justify all the money and time that had been spent in its development.

Start of Inter-Mill Contests

He recited the story of the section as told by the activities reported at different annual meetings, He mentioned the Cleveland Congress in 1925 at which M. G. Hoyman, safety man for Kimberly-Clark Company, presided. Mr. Hoyman started the News Letter, and it was this year that an inter-mill contest sponsored by THE PAPER INDUSTRY was held, forty-one mills taking part. The cup was won by Nekoosa-Edwards. The contest proved to be a unifying activity between annual meetings and was continued by THE PAPER INDUSTRY. The first contest covered one month only, and to maintain interest, and especially to assist mills to train their men in safeworking habits, the contest was extended to cover a period of six months. Mr. Hoyman tried for an entrance list of fifty mills in the contest and was rewarded by a registration of seventy-two mills. Mr. Peacock paid a tribute to Mr. Hoyman and to Mr. Fritz, the publisher of THE PAPER INDUSTRY, by saying: "It is only fair to state at this time that the widespread publicity given the section by its annual contests is due to the inspiration of Mr. Hoyman who, with Mr. Edward B. Fritz, publisher of THE PAPER INDUSTRY, actually made a plan work which the section had talked of for years.

Origin of Regional Conferences

The idea of starting regional conferences was put into practice in 1926, a conference being held in Wisconsin at Green Bay, Chairman Peacock's home town. The attendance at this conference was gratifyingly large, numbering 674 persons, of whom 145 came from thirty paper mills and allied industries.

Three more annual regional conferences to serve paper mills were established during the present year, 1927—28. Ohio mills formed a region last November and in the same month was formed the Valley of the Wisconsin region. A beginning was made in Michigan by C. E. Torrance, of the Bryant Paper Company, Kalamazoo, who organized a regional meeting in connection with the Michigan Safety Conference. Eight regions were now organized, Mr. Peacock said, and as many more could be started with profit to the industry.

Influence of Safety Movement on Production

Chairman Peacock gave some interesting figures from a report of the American Engineering Council. Production in the industry had increased 34 per cent from 1914 to 1925 or 40.7 per cent for each person employed. Accidents had decreased on the average in proportion to the goods produced, but production had become greater and accidents on the whole were more numerous than formerly. The reason was that safe handworking methods were being replaced by machinery and machinery produces more accidents of greater severity.

Making Accidents Look Foolish

The cost of accidents as regards the paper industry is spread over 783 mills, Mr. Peacock said, meaning that premium costs are based upon united experience. He said that accidents could be put in the category of preventable waste and be made to look foolish. Four times the number of mills reporting in 1920 reduced severity averages from 2.60 to 1.57 and frequency from 46.34 to 27.42. The St Croix mill in 1928 went the entire six months without an accident. The methods of the section and the backing offered insures new mills in membership reaping the benefit.

Talks by Regional Directors

Following the presentation of the chairman's report there were five-minute talks by regional directors. Maine wa called first and L. J. Parant responded in the absence of Alvin Record. He said that a big regional safety meeting was to be held at the State Capitol at Augusta on November 19.

Enthusiasm in Massachussetts

Massachussetts had N. F. Bartlett, traffic manager of Hollingsworth & Vose Company, Boston, as spokesman, who reported that a good deal had been accomplished in Massachusetts during the year. Safety work in Massachusetts had become a fixture and he hoped that it would be possible for the Paper and Pulp Section to employ a paid secretary to visit mills and increase the membership. He made a stirring speech declaring that Massachusetts had grasped the safety movement in earnest and the results would be manifested at an early date.

In the absence of C. E. Torrance, Michigan director, a letter from him was read by Chairman Peacock, following which, Mr. Torrance was unanimously reappointed chairman for the ensuing year.

Work in New York State

For New York, Clarence H. O'Connell, superviser of safety, International Paper Company, reported having visited twelve mills in that State and in Canada. He had been appointed a member of the Committee of Arrangements for the present annual Safety Congress. He spoke of the introduction of safety teaching in schools, two schools in New York State having already added instruction in safety methods to the curriculums.

Ohio Encourages Regional Conferences

Ohio, represented by Kenneth L. Faist, safety director of the Champion Coated Paper Company, Hamilton, announced a regional meeting at Columbus, November 13 to 15. He gave an account of a State Safety Conference with a pulp and paper section, in 1927, The section was made permanent by the election of a chairman, vice chairman and secretary, and this led to a meeting in Hamilton last March of the Ohio Paper Safety Conference which was addressed by a representative of the National Safety Council and proved a very worthwhile meeting.

To Interest Machinery Makers

Pennsylvania was represented by E. J. Gayner, assistant factory manager of the Scott Paper Company, Chester, Pa. He told how his company had become interested in the safety movement from its search for methods of preventing accidents. He had tried to get paper mill machinery and equipment firms interested in safety work as he considered it would be helpful to the movement if they would attend meetings.

Interesting the Workman

The Wisconsin River Valley region had F. H. Rosebush present. Mr. Rosebush is manager of industrial relations with the Nekoosa-Edward Paper Company, Pord Edward. He discussed the purpose of regional meetings, saying that the idea was to impress the workman with the principles of safety work and accident prevention, and machine men and foremen were encouraged to attend the meetings.

Advocates a Paid Secretary

John Lundrigan, industrial superintendent of the International Paper Company, was recognized and gave a talk on the present position of regional conference work. In reference to the question of employing a paid secretary or travelling representative to interest nonmember mills in the safety movement, as put forward by Mr. Bartlett, he asked if the Paper and Pulp Section had not advanced beyond the stage of depending on volunteer helpers for regional work. He thought the members might well ponder this question between now and Wednesday. He said he had thought seriously of offering a resolution to consider the appointment of a paid secretary to visit mills and interest the management in the work of the association. At the suggestion of Mr. Rosebush

The Paper Industry Annual Safety Contest

Final Ranking of Paper and Pulp Mills, Members National Safety Council as of June 30, 1928

GROUP A

Final Rank	Member	Mill	Empl.	Hours Worked	No. L.T. Acc.	Days Lost	Rates		Points	
							Freq.	Sev.	Cr.	Dr.
1	Champion Coated Paper Co.	No. 2	592	1794,127	4	12	5.037	.015	526.545	
2	Nekoosa Edwards Paper Co.	Port Edwards	522	802,165	3	167	3.740	.208	525.700	
3	Kimberly-Clark Co.	Niagara	541	750.742	4	131	5.668	.186	500.430	
4	International Paper Co.	Otis	744	919,678	8	135	8.699	.147	461.030	
5	Kimberly-Clark Co.	Falls	757	994,608	9	237	9.049	.238	446.930	
6	Champion Coated Paper Co.	No. 1	1,656	2,135,842	25	155	11.705	.073	425.485	
7	Kimberly-Clark Co.	Kimberly	886	1,171,186	17	445	14.515	.380	354.645	
8	Dill & Collins Co.	Phila.	626	871,367	8	1,183	9.181	1.358	333.045	
9	Mead Pulp & Paper Co.	Scioto	696	964,223	18	225	18.668	.233	310.015	
10	Northern Paper Mills	Green Bay	615	803,112	14	344	17.432	.428	308.170	
11	Laurentide Co. Ltd.	Grand 'Mere	998	1,160,871	18	1,180	15.506	1.016	276.885	
12	The Northwest Paper Co.	Cloquet	566	770,971	20	160	25.941	.208	205.615	
13	Continental Paper & Bag Mills Corp.	Rumford	1,071	1,370,892	34	1,539	24.801	1.123	133.400	
14	Marathon Paper Mills Co.	Rothschild	592	330,385	27	263	32.515	.317	103.800	
15	Canada Power & Paper Corp.	A. A.	866	1,144,121	37	701	32.339	.613	76.715	
16	Powell River Co. Ltd.	B. C.	1,203	1,642,935	57	766	34.694	.466	57.770	
17	West Virginia Pulp & Paper Co.	Luke	1,287	1,686,114	74	506	43.888	.300		56.970
18	Bogalusa Paper Co.	Bogalusa	751	1,217,770	60	587	49.270	.482		152.055
19	Pacific Mills, Ltd.	Pacific	1,015	1,402,909	82	389	58.450	.277		262.700
20	Minnesota & Ontario Paper Co.	Kenora	552	570,861	39	267	68.318	.468		422.770
21	Minnesota & Ontario Paper Co.	Ft. Frances	515	644,508	43	525	66.718	.815		434.615
22	Minnesota & Ontario Paper Co.	International Falls	966	1,249,856	101	2,467	80.809	1.974		751.815
	Canadian International Paper Co.	Gatineau	*	*	*	*	*	*	*	*
	Totals		18,017	23,854,243	702	12,384	29.429	.519	127.685	

GROUP B

1	St. Croix Paper Co.	St. Croix	438	565,977	0	0	0	0	600.	
2	Finch, Pruyn and Co. Inc.	Glen Falls	307	403,196	0	0	0	0	600.	
3	Nekoosa Edwards Paper Co.	Nekoosa	451	570,162	3	40	5.262	.070	517.830	
4	International Paper Co.	Niagara Falls	497	661,849	4	85	6.044	.128	500.860	
5	Kimberly-Clark Co.	Badger-Globe	484	571,058	3	143	5.253	.250	499.955	
6	The Falls Mfg. Co.	Oconto Falls	296	427,172	3	10	7.023	.023	497.375	
7	International Paper Co.	Piercefield	310	435,202	3	131	6.893	.301	471.430	
8	Hollingsworth and Vose Co.	West Groton	202	271,652	2	81	7.362	.298	465.030	
9	The Mead Fibre Co.	Kingsport	368	524,468	4	226	7.627	.431	447.945	
10	American Writing Paper Co.	Crocker	252	287,353	3	17	10.440	.059	444.955	
11	Strathmore Paper Co.	Mitteneague No. 1	263	276,807	4	8	14.451	.029	390.655	
12	American Writing Paper Co.	Riverside	226	273,266	3	157	10.978	.575	385.670	
13	Bird and Son, Inc.	East Walpole	388	536,908	8	74	14.900	.138	373.345	
14	Strathmore Paper Co.	Woronoco No. 2	216	255,215	4	27	15.673	.106	365.500	
15	Crocker McElwain Co.	Holyoke	220	244,062	4	60	16.389	.246	341.270	
16	American Writing Paper Co.	Beebe-Holbrook	260	282,388	6	43	21.247	.152	281.280	
17	The Michigan Paper Co. of Plainwell	Michigan Paper Co.	273	351,297	8	94	22.773	.268	247.870	
18	Chemical Paper Mfg. Co.	Holyoke	353	419,866	10	95	23.817	.226	237.155	
19	Rhinelander Paper Co.	Rhinelander	408	535,423	13	127	24.280	.237	229.445	
20	Marinette & Menominee Paper Co.	Marinette	424	510,923	6	1,150	11.743	2.251	207.145	
21	Thilmany Pulp & Paper Co.	Kaukauna Paper Mill	363	455,052	12	79	26.371	.174	205.870	
22	International Paper Co.	Glen No. 5	323	399,839	10	192	25.010	.480	194.715	
23	Fort Howard Paper Co.	Green Bay	278	372,341	11	75	29.543	.201	157.855	
24	Fort Huron Sulphite & Paper Co.	Port Huron Sulphite & Paper Co.	237	327,940	10	155	30.493	.473	117.085	
25	Hollingsworth & Vose Co.	East Walpole	288	332,765	11	72	33.056	.216	106.170	
26	Cornell Wood Products Co.	Cornell Wood Products	332	563,708	13	1,319	23.062	2.340	36.545	
27	The Warren Manufacturing Co.	Milford	402	670,164	26	370	38.796	.652		9.430
28	Spruce Falls Power & Paper Co.	Spruce Falls	546	693,949	28	523	40.349	.754		51.815
29	Scott Paper Co.	Chester	497	635,991	29	198	45.598	.311		82.500
30	Mosinee Paper Co.	Mosinee	458	604,523	21	1,162	34.736	1.922		88.455
31	Thelmany Pulp & Paper Co.	Sulphate Pulp Mill	239	303,898	14	103	46.070	.339		92.045
32	Great Western Paper Co.	Great Western Paper	258	326,372	16	159	49.024	.487		149.045
33	Bryant Paper Co.	Bryant	234	279,969	20	466	67.121	1.564		515.270
34	Escanaba Paper Co.	Groos	225	314,038	24	208	76.424	.662		557.970
	River Side Fibre & Paper Co.	Pulp & Paper	*	*	*	*	*	*	*	*
	International Paper Co.	Louisiana	*	*	*	*	*	*	*	*
	Fox River Paper Co.	Fox River	*	*	*	*	*	*	*	*
	Racquette River Paper Co.	Paper & Pulp	*	*	*	*	*	*	*	*
	Totals		11,316	14,684,783	336	7,649	22.881	.521	221.030	

GROUP C

1	Defiance Paper Co.	No. 2	166	177,744	0	0	0	0	600.	
2	Kimberly-Clark Co.	Atlas	138	174,507	0	0	0	0	600.	
3	Kimberly-Clark Co.	Neenah	84	89,241	0	0	0	0	600.	
4	United States Gypsum Co.	N. Kansas City	45	83,566	0	0	0	0	600.	
5	United States Gypsum Co.	Gypsum, O.	43	77,477	0	0	0	0	600.	
6	International Paper Co.	Riley	64	75,578	0	0	0	0	600.	
7	American Writing Paper Co.	Linden Division	192	216,855	1	6	4.611	.028	531.330	
8	Marinette & Menominee Paper	Menominee	149	213,252	1	50	4.689	.234	509.615	
9	The Gardner & Harvey Co.	No. 3	63	106,364	1	1	9.402	.009	464.785	
10	American Writing Paper Co.	Parsons Division	175	206,919	2	5	9.666	.024	459.515	
11	International Paper Co.	Livermore	91	119,897	1	26	8.340	.217	459.155	
12	Bird & Son, Inc.	Phillipsdale, R. I.	158	199,386	2	8	10.031	.040	452.700	
13	The Adams Bag Co.	The Adams Bag Co.	142	190,365	2	75	10.506	.394	410.515	
14	International Paper Co.	Webster	111	145,474	2	13	13.775	.089	394.700	
15	The Beveridge Paper Co.	Beveridge Paper	140	255,225	4	76	15.672	.298	346.315	
16	American Writing Paper Co.	Albion Division	177	189,220	2	52	15.055	.275	346.000	
17	The Upson Co.	Board Mill	93	125,653	2	45	15.917	.358	336.815	
18	United States Gypsum Co.	Lancaster, O.	36	50,597	1	30	19.764	.593	258.355	
19	Strathmore Paper Co.	Woronoco No. 1	101	119,142	3	8	25.180	.067	233.585	
20	The Gardner & Harvey Co.	No. 1	160	244,764	6	40	24.513	.163	233.515	
21	American Writing Paper Co.	Platner-Porter Div.	83	78,942	2	7	25.335	.089	229.170	
22	Robertson Paper Box Co.	Rockland	35	39,108	1	4	25.570	.102	224.515	
23	Hawthorne Paper Co.	Hawthorne Paper	144	201,634	5	62	24.797	.307	215.055	
24	Sorg-Oglesby-Smith Paper Co.	Oglesby	185	283,607	7	161	24.682	.568	190.600	
25	The Warren Manufacturing Co.	Riegelsville	51	73,366	2	19	27.261	.259	184.655	
26	International Paper Co.	Montague	188	250,238	7	85	27.973	.340	166.385	
27	The Franklin Board & Paper Co.	Franklin	100	132,444	4	19	30.201	.143	154.255	
28	Union Bag & Paper Co.	"No. 5" Paper	79	97,845	3	22	30.661	.225	139.485	
29	American Writing Paper Co.	Dickinson Div.	147	122,168	4	38	32.742	.311	101.155	
30	Thilmany Pulp & Paper Co.	Wis. Tissue	89	113,032	4	38	35.388	.336	60.855	
31	The Crystal Tissue Co.	Crystal Tissue	197	316,197	11	181	34.788	.572	45.830	
32	The Warren Mfg. Co.	Hughesville	76	108,055	3	181	27.764	1.675	35.870	
33	Bergstrom Paper Co.	Bergstrom Paper	167	218,475	8	91	38.617	.417	35.200	
34	American Writing Paper Co., Inc.	Nonotuck Division	140	158,091	6	38	37.953	.240	33.815	
35	American Writing Paper Co., Inc.	Wauregan Division	87	80,908	3	41	37.079	.507	19.600	
36	American Writing Paper Co., Inc.	Mt. Tom Division	83	104,679	4	45	38.212	.430	11.600	
37	The Gardner & Harvey Co.	No. 2	103	156,252	6	71	38.400	.454	6.030	
38	Strathmore Paper Co.	Mittineague No. 2	110	102,597	4	65	38.987	.634		20.355
39	Sorg-Oglesby-Smith Paper Co.	Sorg Paper Co.	226	348,499	8	1,128	22.956	3.237		51.645
40	Defiance Paper Co.	No. 1	126	164,699	7	103	42.502	.625		69.670
41	Union Bag & Paper Corp.	"Fenimore" Paper	160	191,678	9	119	46.984	.621		132.870
42	Mead Pulp & Paper Co.	Peerless Division	99	125,160	6	78	47.939	.623		147.145
43	Bemis Brothers Bag Co.	Peoria, Ill.	246	313,959	16	309	50.692	.984		222.570
44	The Warren Manufacturing Co.	Warren	132	180,100	10	111	55.525	.616		254.815
45	Lowe Paper Co.	Lowe Paper	155	207,255	12	133	57.900	.642		291.345
46	Bryant Paper Co.	Superior	101	129,885	7	82	61.583	.708		350.700
47	Union Bag & Paper Corporation	Allen Paper	71	93,275	6	54	64.326	.579		376.845

The Paper Industry Annual Safety Contest

Final Ranking of Paper and Pulp Mills, Members National Safety Council as of June 30, 1928

GROUP C--Continued

Final Rank	Member	Mill	Empl.	Hours Worked	No. L.T. Acc.	Days Lost	RATES		POINTS	
							Freq.	Sev.	Cr.	Dr.
48	Waldorf Paper Products Co.	Midway	166	247,662	16	224	64.604	.904		413.315
49	Bryant Paper Co.	Milham	155	195,845	14	102	71.485	.521		443.315
50	Lincoln Pulp & Paper Co. Ltd.	Sulphite	114	148,272	10	173	66.767	1.166		470.415
51	Defiance Paper Co.	No. 3	112	97,110	7	61	72.083	.628		490.755
52	Lincoln Pulp & Paper Co. Ltd.	Lybster	102	126,220	9	112	71.304	.889		507.470
53	Itasca Paper Co.	Itasca	150	227,470	17	119	74.735	.523		519.945
54	Sorg-Oglesby-Smith Paper Co.	Smith	53	86,988	1	1,000	11.496	11.496		713.830
55	International Paper Co.	Winnipiseogee No. 10	79	104,519	9	105	86.109	1.006		730.630
56	The Northwest Paper Co.	Brainerd, Minn.	177	224,794	19	310	84.522	1.379		745.355
57	American Writing Paper Co.	Windsor Division	144	153,833	14	222	91.008	1.443		844.415
58	Lincoln Pulp & Paper Co. Ltd.	Lincoln	62	67,703	6	187	88.622	2.762		893.650
	United States Gypsum Co.	Oakfield, N. Y.	*	*	*	*	*	*	*	*
	Lawrence Paper Mfg. Co.	Lawrence	*	*	*	*	*	*	*	*
	Diamond State Fibre Co.	Paper Mill	*	*	*	*	*	*	*	*
	Totals		7,024	9,134,790	317	6,335	34.702	.694	34 855	

* Complete returns not received.

GRAND TOTAL AND AVERAGES

Total Mills		Employees	Hours Worked	Acc.	Days Lost	Freq.	Sev.	Points Credit
23	Group A—Over 500 Employees	18,017	23,854,243	702	12,384	24.429	.519	127.685
38	Group B—201 to 500 Employes	11,316	14,684,783	336	7,649	22.881	.521	221.030
61	Group C—20 to 200 Employes	7,024	9,134,790	317	6.335	34.702	.694	34.855
122		36,357	47,673,816	1,355	26,368	28 422	.553	138.670

it was decided to discuss the subject with W. H. Cameron, managing director of the National Safety Council, and report at a later sitting. The meeting was then adjourned for the day.

SECOND SITTING, TUESDAY MORNING

An interesting program had been arranged for the second sitting of the Paper and Pulp Section when it was called to order shortly after 9:30 o'clock on Tuesday morning by Chairman Peacock, who disposed of some routine business before turning the meeting over to F. H. Rosebush. He read a letter from Alvin Record, regional director for the State of Maine, who explained that he had been detained at Chisholm on jury duty. The letter announced a forthcoming regional safety meeting at Augusta which would be attended by the Governor of the State.

Chairman Peacock appointed a committee of three to interview W. H. Cameron managing director of the Safety Council, on the subject of employing a paid secretary to visit mills and add to the membership. He then called upon Mr. Rosebush to take the Chair and conduct the meeting.

The Program

Chairman Rosebush commented on the subjects to be discussed, saying it had been the aim of the Program Committee to present a program that would satisfy the greatest number. There were three papers to be presented, as follows:

"The Relative Importance of the Plant Safety Department," by W. F. Ashe, employment manager of the Thilmany Pulp and Paper Company, Kaukauna, Wis.; "Some Outstanding Hazards in Paper Mills and Their Control," by C. H. O'Connell, safety engineer, International Paper Co., New York, and "The Promotion of Health in Conjunction with Safety," by Dr. J. G. Cunningham, director of Industrial Hygiene, Department of Health, Toronto, Can.

Safety Work in the Time of Moses

Mr. Ashe had no prepared paper but talked in an extemporaneous fashion, giving his personal impressions of how safety work ought to be carried on in a paper mill. He traced the origin of the safety movement to the time of Moses and quoted from the eighteenth chapter of Exodus to show the need of a proper division of authority in work of this kind. He reminded the biblical students present that Jethro, the priest of Midian, Moses's father-in-law, told Moses that he was attempting too much by undertaking to counsel all the people himself but should place over them able men to be rulers of thousands, rulers of hundreds, rulers of fifty and rulers of ten. In the same way superintendents should be rulers over 1,000, foremen over 500 and straw foremen over twenty-five, so that the man in authority over all should have time to think about his job.

The Question of Authority

Mr. Ashe questioned the wisdom of investing the safety man with specific authority. The man who succeeds best is the man who takes authority and assumes responsibility. His idea of a good safety man was one who inspired the foremen and men under him to do the right work and he counselled all safety engineers to build themselves up until they could assume a place of leadership for the men under them. There were many things to be considered in reference to the capacity of individuals in developing a good record for the mill as regards freedom from accidents. Some men were constitutionally unfit to work with machinery and safer places should be found for them in other departments of the plant. In reference to this Mr. Rosebush said he recalled having been told by Miss Baker, of the Kimberly-Clark Company, that she had transferred a man from one job to another eight times in succession until his proper place had been found.

Outstanding Hazards in Paper Mills

Clarence H. O'Connell was then asked to present his paper on "Some Outstanding Hazards in Paper Mills and Their Control". This was a paper that showed care in its preparation and it was recognized as a most valuable contribution to the proceedings of the Section. He began with the woodroom of a mill where thirteen-foot logs traveling up an inclined log haul might be disengaged at any time from the hooks and tumble backwards. Accidents of this kind might be guarded against by having sufficient clearance at the sides and bottom of the incline for men to jump away.

The danger of men climbing over the moving chains of conveyors was mentioned and signs forbidding this practice should be posted. Risks incident to the dropping of logs in unloading cars was touched upon and special attention was called to the precautions necessary in taking wood from piles of 20,000 cords or less.

Electrical Hazards—Thorough instruction of the electrical workers, continuous inspection of equipment and the provision of safety equipment, such as rubber mats, gloves, fuse pullers, rubber blankets, etc., were advised. It was recommended to hold special safety meetings for electrical workers. What cannot safely be dispensed with among electrical workers was, he said, a well-trained first-aid team. Of extreme importance in connection with electricity controlled machinery was the use of danger tags on controls when it was necessary for a workman to make repairs. The fullest

protection should be given to workmen exposed to live wires. This should take the form of supervision by a foreman or expert.

Danger from Steam—The failure of steam valves to operate was sometimes the cause of fatal injuries. When steam is delivered under pressure to digester or bleaching tank where it is sometimes necessary for employees to go for inspection, repairs or cleaning, a safety valve should be easy of access and plainly marked "Safety Valve."

Beater Risks—The broke beater was referred to as a potential hazard, as employees, unless cautioned and watched, have a tendency to lean too far over while feeding the beater, thus exposing themselves to the danger of being drawn in with the broke.

Some men will climb into a beater and tread down the stock to relieve plugging—a highly dangerous practice.

Prominent Hazards—Mr. O'Connell reviewed the accidents involved in handling belts and in washing felts. He also spoke of the danger connected with paper machine winders on account of their speed and the inrunning nip. Certain practices were condemned, as the one of using rope on winder shafts to prevent a roll slipping. The use of a cloth or piece of broke to drip water on the reel was dangerous, as the hanging cloth or broke might be drawn in rapidly between the reel, and the workman's hand with it. The use of a sponge was recommended in place of strips of rag or paper for moistening the reel.

Calender Guards—The question of a satisfactory guard or protection for the nip was mentioned by Mr. O'Connell and came in for a good deal of discussion later on. As a good practical guard he recommended the use of a reinforced wire mesh in an angle-iron frame about a foot wide and extending the width of the machine.

About Going Barefoot—In the discussion following Mr. O'Connell's paper, interest centered around methods of compelling the men in machine rooms to wear shoes and on methods of preventing injuries at supercalenders and machine calenders. Mr. Faist was given time to explain a device in use at the mills of the Champion Coated Paper Company for preventing men from having their hands caught in the nips of calenders. He said the device had been described fully in the May issue of National Safety News.

Where five or six accidents a month were formerly reported, none now occurred with supercalenders.

Ban on Rubber Shoes—As to means for compelling men to wear shoes Mr. Rosebush said that in his mill an order was issued that men must wear shoes or quit work. Mr. Peacock said his company provided the men with small square foot baths having running hot and cold water which were greatly appreciated by the men and reconciled them to the wearing of shoes at work around the paper machines, even at washing-up time. Rubber-soled shoes should be avoided as being too slippery on a wet floor where oil was present.

Relation of Health and Accidents

Dr. J. G. Cunningham, of the Toronto Health Department was then introduced to give a talk on the relation of health conditions to the incidence of accidents. As there were persons with a susceptibility to diseases, so there were individuals who were prone to suffer minor accidents and there was a certain relation between minor accidents and serious accidents. It was of importance to consider the condition of the individual with regard to his susceptibility to accidents or disease. Workers with some disabilities are unsafe in certain occupations and there were indications that ill health influences accidents in obvious ways.

Value of Periodical Examinations—Doctor Cunningham emphasized the value of periodical examinations to determine the physical condition of the worker. The individual is often unaware of a pathological process in his body until considerable damage has been done and may know nothing of it until it has been revealed by a physical examination. He said it was on this account that periodic examination was even more important than examination on employment.

He said that while there was no relation between the number of accidents and the amount of time lost in sickness, there was a certain relation between the number of accidents and the number of visits to the first-aid room for minor accidents. He considered the latter an index of the number of cases presenting some maladjustments somewhere. The control of ill health was desirable for the prevention of accidents.

Minor Ailments and Minor Accidents—In the discussion which followed, several members gave testimony to the correctness of Doctor Cunningham's observations. Ernest Augustus, of the Mead Pulp and Paper Company, said that from a study of the records it would be found that a man who continually sought relief at the medical department for headaches and throat troubles was frequently the subject of minor injuries, and investigation would generally show that the man was employed on the wrong job. In reply to an inquiry as to how often a workman should be examined by the medical officer, whether every six months or once a year, Doctor Cunningham said that the man's condition should be the guide.

The forenoon sitting was then adjourned.

Safety Supervisors' Meeting, Tuesday Afternoon

A general meeting of group plant safety supervisors was held at Hotel Pennsylvania in the afternoon at 2 o'clock, under the chairmanship of W. H. Winans, manager of industrial relations with the Union Carbide Company, New York. This was a largely attended meeting that nearly filled the ball room of the hotel. M. G. Hoyman, of the Kimberly-Clark Corporation, was on the program to present the first paper, but in deference to Major Henry A. Reninger, of the Lehigh Portland Cement Company, who had another meeting to attend, Mr. Hoyman gave way. Major Reninger gave a general acount of the methods employed in his company of maintaining the efficiency of safety work, without particular reference to pulp and paper plants.

Safety Work in Distant Plants

Mr. Hoyman discussed the question of administering safety work in the plants of a company that are separated by great distances. While several pulp and paper mills of the Kimberly-Clark Corporation are located within twelve miles of the general offices in Neenah, Wis., there is a group of mills a considerable distance away. One mill in this group is 130 miles from Neenah, another 700 miles and still another 1,400 miles away. It was Mr. Hoyman's opinion that the administration of safety work in outlying mills differs little from the methods employed in a single mill or in a number of mills adjoining each other, though each mill had its own risks and problems which called for a program built around the particular plant's needs.

He described some of the safety methods that worked particularly well in the distant plants of the Kimberly-Clark Corporation, pointing out the characteristics, and generalizing upon the experiences gained.

In one plant situated 130 miles from the main office there was an average, fourteen years ago, of 105 accidents a year, with an average loss of 1,401 working days in the period. After the operation of safety regulations for four years, from 1924 to the present year, the average number of accidents per annum was only eleven, with an average loss of 593 working days, which is less than half the number of days lost in the earlier period, notwithstanding an increased payroll.

During the four years beginning with 1914 the lost time caused by accidents in the distant mill amounted to two days a year for each man on the pay roll. During the four years beginning with 1924 the lost time caused by accidents amounted to but one day a year for each man on the pay roll. During this ten-year period the accident frequency rate was cut down to about one-eight (12 per cent) of its original value. The accident severity rate was cut down to less than one-half (47 per cent) of its original value.

Of the methods employed by the Kimberly-Clark Corporation to arouse the interest of the men in safety work, the safety contest device was considered particularly good, as serving to create the right feeling and attitude among the employees. The contest is not put on until some mill or de-

partment expresses a desire for it, and it is usually put on by some department or mill that feels pretty strong in safety and is looking for a fight with some other department or mill. The fact that mills participating in a contest are many miles apart is no handicap, as interest is maintained by an eloborate system of bulletins which brings all mills in close contact. Bulletins are exchanged between all plants in the company and a bulletin from each plant is sent every week to the central office. Telegrams are used during the height of a contest to broadcast the standings of the competing mills, a typical telegram being instanced as follows: "Niagara had an accident, Alfred Gercu, construction laborer, while getting off truck, wrenched knee, lost one day, Tuesday, June 8."

One of the most effective safety devices used by the company is called the "One Hundred Year Safety Man Award". The essence of this is that by working safely a certain number of man days, every man in the department from superintendent to sweeper receives a brand new five dollar bill.

Mr. Hoyman explained the system as follows: "There are 310 working days in one year. One hundred men working one year would work a total of 31,000 man days, or one hundred man years. A five-dollar award is made when the 'safety man' in the department is 100 years old. For instance, a department of 100 men working safely one year, or a department of fifty men working two years, or a department of 200 men working safely half a year would receive the award. Deductions are made from the age of the 'safety man' for accidents and for days lost."

A great event is made of the award of these premiums, the department being closed down for five or ten minutes and an official of the company being present to congratulate the men on their fine record. It is explained to the men that it means profit for the company as well as profit for the men. The men are told that by working safely they help the company to carry its compensation insurance, and $500 is a low premium to pay on the safety of 100 men for one year.

A safety suggestion system is also employed and helps to keep safety at distant mills. A man whose suggestion is adopted feels that he is part of the company as a whole, even though employed at a plant 1,000 miles distant from other plants.

Intelligent co-operation on the part of the foreman was necessary. It is his function to unite safety and work. Safety must not be looked upon as a thing separate from work. Safety is a method of working and a method under the control of the foreman to whom safety responsibility is squarely put up. Foremen are made to feel that accidents are their own fault.

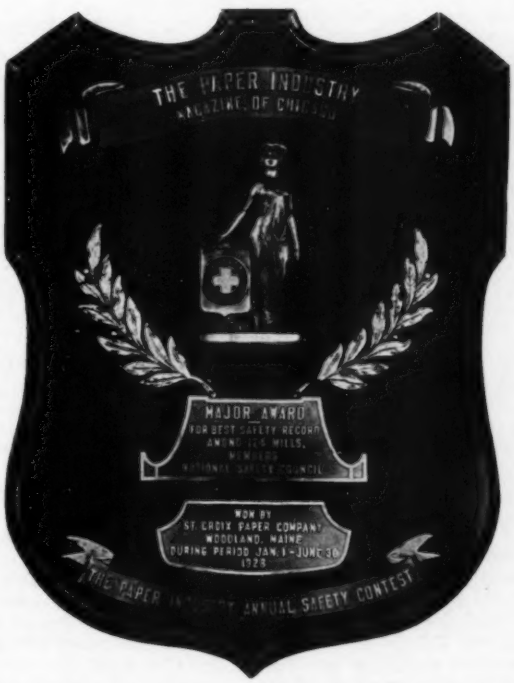
There was no discussion of Mr. Hoyman's paper, and following an election of officers for the section, John Lundrigan, industrial superintendent with the International Paper Company, New York, was asked to present his paper bearing the title "What Should be the Status of the Group Plant Engineers."

Group Plant Safety Engineers

Mr. Lundigran said that he knew of no better way of defining his judgment of what should be the status of the group plant safety engineer in industry than to give verbatim the rules and regulations under which safety affairs are managed by the International Paper Company, an organization which he considerd to be fairly representative of both a large industry and a group of separate small industries. The plan followed was capable of application to any type of industry, number of plants of the same industry, or groups of plants of various industries in the same localities. He accordingly outlined the operation of the safety organization and gave a verbatim version of the rules.

Mr. Lundigran also gave particulars of the employment service. The original plan was to put into practice in 1917, additions being made from time to time. It had never been necessary to withdraw any important provision of the plan, which he

Trophies Awarded to Winners in the 1928 Safety Contest



Major trophy awarded by The Paper Industry

Group trophies awarded by National Safety Council. Left to Right—Group A, Group B, Group C

considered good evidence that it was a satisfactory one, the best that could be devised.

This practically completed the program so far as the Paper and Pulp Section was concerned, the remaining paper being concerned with safety experiences in a rubber plant as presented by Ernest W. Beck, supervisor of safety, United States Rubber Company, New York.

THIRD SITTING, WEDNESDAY MORNING

Before turning over the conduct of the meeting to B. D. Rogers, of Bird & Son, as had been arranged at the preceding sitting, Chairman Peacock said he would occupy a few moments of spare time in a discussion of the question of employing a paid secretary or traveling representative for the purpose of increasing the membership. He suggested that the section meet as a committee of the whole and he asked F. H. Rosebush, of the committee that had interviewed Director Cameron on the subject, to tell those present what had been accomplished.

Favors Employing Paid Secretary

Mr. Rosebush said he had called on Mr. Cameron in company with B. D. Rogers and they had received assurances from him that the National Safety Council would assist in every way possible, but the expense of hiring a paid secretary or a representative (Mr. Cameron preferred the title representative) would have to be met by the industry. The Petroleum Section employed a paid representative and it was one of the most active sections of the National Safety Council.

Sum of $10,000 Necessary

Mr. Rogers gave his impressions of the interview. It had been ascertained that the amount of money necessary to be raised for the hiring of a paid representative would be approximately $10,000. Director Cameron said he would assist in raising a fund of this amount which could then be allocated among the mills. Mr. Rogers considered that it would be a great boon to the section if this could be done but neither he nor any of the other speakers had any hope of being able to raise the amount.

Mr. Ashe said he was not convinced that it was the right thing to do. A paid representative could not be expected to do the work of volunteer workers. With a paid man acting for the section, Mr. Ashe asked if it would not give rise to a tendency on the part of the members to "let George do it."

Number of Days Assessed for Death

Mr. Peacock brought up the question of number of days that was proper to be assessed against the mill for a fatal accident. He recalled that at the Detroit meeting two years ago, John Lundrigan had exposed the fallacy of assessing 6,000 days for a death. He said that if the Paper and Pulp Section continued to assess a death at 6,000 days or twenty years, it would not be long before the insurance companies would assess paper manufacturing firms on that basis.

Mr. Peacock suggested that a plea be made to the National Safety Council to change the scale of time losses for deaths in future contests from 6,000 days to 1,000 days. This is the basis adopted by a number of western mills and it is the standard of the International Paper Company which has never admitted more than a 1,000 day penalty.

At this point Mr. Peacock yielded the Chair to B. D. Rogers, who called for the regular program of papers and other business.

Accidents from Faulty Lighting

W. T. Blackwell, of the New Jersey Public Service Corporation, was asked to present his paper "The Importance of Lighting and Its Relation to Safety". He talked extemporaneously for the most part, discussing the relation of poor lighting to frequency of accidents. There was, however, a lack of dependable data bearing on the subject. It was important, he thought, in reporting accident cases to investigate the direct cause of the accident. Like Mr. Ashe, he cited the Bible for the earliest reference to lighting, remarking at the same time that one could go to the Bible for anything. Coming forward in point of time, he instanced references to illumination in the work of Marco Polo who reported the use of petroleum for burning in the year 1100. He touched on more practical matters pertaining to safety work by referring to the bad effects of glare on workers and gave instances of faulty arrangement of lights and reflectors, with remedies. He said that the large lighting companies like the Edison Company and the Westinghouse Company offer courses of instruction in lighting free of charge and suggested that employers would reap benefit by allowing their men to attend these courses.

It was asked by one member if the General Electric Company, for instance, would provide an illuminating engineer to make a survey of a plant if requested, and Mr. Blackwell said that any of the large companies would be glad to do this.

In response to a query by Mr. Rosebush concerning a code of lighting requirements, Mr. Blackwell called attention to the Illuminating Engineers Safety Code which was published by the U. S. Department of Labor and is obtainable from the Superintendent of Documents at Washington.

Mr. Simpson, of the Travelers' Insurance Company, discussed Mr. Blackwell's address and re-enforced many of his statements.

First Aid to the Injured

Dr. P. H. Hourigan, plant surgeon of the Larkin Company, Buffalo, was down on the program for a paper entitled "How to Administer First Aid in Both the Small and the Large Plant", but like Mr. Blackwell, he did not stick very closely to his text. For a plant of 100 employees or less, a first-aid cabinet should be provided and along with this would go the necessity of having somebody to handle the cabinet. He gave a chatty and interesting summary of the necessary equipment of a first-aid cabinet and distributed a few copies of Bulletin 85 issued by the State Insurance Fund of New York. This prescribes the contents of first-aid cabinets and the equipment of dispensaries and emergency hospitals. Doctor Hourigan is not convinced that mercurochrome solutions are any improvement over tincture of iodine as local antiseptics.

Important to Treat Petty Injuries

He favored the use of a diluted tincture of iodine by the addition of 50 per cent of alcohol, which would bring the iodine percentage down to 3.5. Most doctors are opposed to the use of tourniquets for the control of hemorrhage. All hemorrhages could be controlled by pressure properly applied. He was emphatic about the necessity of taking immediate care of petty injuries, scratches, etc., that would be likely to cause infection, and was strong for the development of first-aid teams in a manufacturing plant. He thought it would be serviceable if demonstrations could be given of the nature of the germs of infection by the use of photomicrographs projected on a screen as was now being done by the Eastman Kodak Company. It was brought out in the course of the discussion that infected wounds formed one-sixth of compensation costs. He again emphasized the need for trained men in the application of first-aid treatment.

Regional Director's Plans

Following this there was a discussion of the plans of regional directors. Mr. Rosebush again brought up the question of the employment of a permanent paid secretary and went over the question of cost as discussed with Director Cameron, of the National Safety Council. He said he was undecided as to what recommendation to make at this time, whether to refer the subject for consideration to a special committee or not. Mr. Rogers favored the idea of a special committee and moved that one be appointed to investigate the desirability of engaging a paid representative for work in increasing the membership of the section. At the suggestion of L. J. Parant, an ammendment was incorporated instructing the committee to confer with the American Paper and Pulp Association.

Plea for 1000-Day Assessment

A motion was also adopted to request the National Safety Council to use 1,000 days instead of 6,000 days as the figure for assessing fatalities, with a proportional number of days for less serious injuries.

New Officers Elected

The report of the Nominating Committee for officers to serve during the ensuing year was then called for, and W. A.

Gleason, chairman, responded with the following slate, which on motion was accepted, nominees being afterwards elected by one affirmative ballot:

Chairman—Kenneth L. Faist, Champion Coated Paper Company, Hamilton, Ohio.

Secretary—O. B. Thirkfield, Oglesby-Smith Paper Company, Middletown, Ohio.

Vice Chairman for Canada—A. P. Costigane, Ontario Pulp & Paper Makers' Safety Association, Toronto.

Vice Chairman for South—G. W. Phillips, Champion Fibre Company, Canton, N. C.

Extreme Southern District—W. H. Jennings, Bogalusa Paper Company, Bogalusa, La.

Vice Chairman for Middle West—M. G. Hoyman, Kimberly-Clark Corporation, Neenah, Wis.

Vice Chairman for East—N. F. Bartlett, Hollingsworth & Vose Company, Boston, Mass.

Vice Chairman for Paper Box Manufacturers—H. C. Sackett, Alton Box Board & Paper Company, Alton, Ill.

Engineering Representative—R. M. Altman, Marathon Paper Mills Company, Rothschild, Wis.

Regional Directors

Maine—Alvin Record, International Paper Company, Chisholm, Me.

New Hampshire—J. J. Tellington, Brown Company, Berlin, N. H.

Massachusetts—A. S. Wilson, American Writing Paper Company, Holyoke, Mass.

Michigan—C. E. Torrance, Bryant Paper Company, Kalamazoo, Mich.

New York—S. Pruyn, Finch, Pruyn & Co., Inc., Glens Falls, N. Y.

Ohio—Ernest Augustus, Mead Pulp and Paper Company, Chillicothe, Ohio.

Pennsylvania—F. W. Plowman, Scott Paper Company, Chester, Pa.

Wisconsin Valley—F. H. Rosebush, Nekoosa-Edwards Paper Company, Port Edwards, Wis.

Fox River Valley—W. F. Ashe, Thilmany Pulp & Paper Company, Kaukauna, Wis.

Chairman Poster Committee—Amiel Umberham, Fort Howard Paper Company, Green Bay, Wis.

Chairman Membership Committee—Earl E. Grant, Crystal Tissue Company, Middletown, Ohio.

Chairman Contest Committee—A. Scott Dowd, THE PAPER INDUSTRY, Chicago.

Chairman Committee on Health Research—J. J. Plazak, Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis.

After the passage of a rising vote of thanks to the officers who had served during the past year the section adjourned for a luncheon meeting in an adjoining room.

FINAL SITTING, WEDNESDAY AFTERNOON

There was an attendance of close on to 100 at the final sitting on Wednesday afternoon when President Homer E. Niesz. of the National Safety Council and Edward B. Fritz, publisher of THE PAPER INDUSTRY, Chicago, presented trophies to the winners of the annual safety contest.

After a hasty luncheon had been disposed of, Retiring Chairman Peacock introduced all of the new officers of the section who were in attendance. Asking Kenneth L. Faist to stand up, he transferred his own badge as chairman to Mr. Faist, taking Mr. Faist's in exchange. Mr. Faist spoke briefly, pledging himself to do everything in his power to make the Paper and Pulp Section of the National Safety Council a greater success than ever.

Short talks were also made by W. H. Jennings, of the Bogalusa Paper Company, F. G. Hoyman, Nat. S. Bartlett and J. H. Tellington. The regular program was then taken up and F. L. Irvin was called upon.

Influence of Safety Regulations in Mills

Mr. Irvin, who is supervisor of employment at the plant of the St. Croix Paper Company, Woodland, Me., gave an account of the influence and results of safety work in the plant where he is employed. Organized work in accident prevention was started in January, 1927, with the creation of a safety department. The general manager or superintendent of the plant is regarded as the key man to safety. A comprehensive program of educational work is carried on to teach and train men to follow safe methods of work. He enumerated a series of six methods of interesting the men in safety work, which may be briefly summarized as follows:

Display on bulletin boards or poster services of the National Safety Council and the Elliott Service Company.

Distribution to employees of **The Safe Worker** as published monthly. This is taken home for reading in the family and has the effect of emphasizing what an accident to the breadwinner would mean.

Distribution of safety slogans in pay envelopes. The slogans are printed on small, numbered cards and a small cash prize is paid to the holder of any card bearing a certain number.

The publication of a plant newspaper to drive home the safety idea. The articles relating to the National Safety Contest were effective in arousing the interest of the men and resulted in the winning of "Class B" cup by the St. Croix mill.

Every third Sunday pictures are projected from a motion picture machine giving lessons in safety.

First-aid classes are formed for the demonstration of the prone pressure and pulmotor methods of resuscitation.

In addition to a continuous educational program of this kind the company provides a hospital equipped with modern apparatus and a sunny and well furnished first-aid room. Mr. Irvin enumerated some of the important medical apparatus which have been installed in the hospital. These include a complete line of Victor diathermy machines, such as an ultra-violet ray lamp, both water and air cooled; a high frequency machine; the Wantz generator, and a complete x-ray outfit, all for the use of employees. The ultra-violet water-cooled lamp is used on all minor wounds, abrasions and cuts, while the air-cooled lamp is for skin infections and poisoning from wood bark, oil, and the like.

The men now take more care of small cuts and scratches than formerly, and this is placed to the credit of intelligent and persistent safety propaganda. It is now the practice for every man in the plant to report for first-aid treatment for the slightest scratch, thereby lessening the possibility of suffering, of a loss in wages to the workman and lessened efficiency of the plant.

Mr. Irvin said that the employees of his mill were thoroughly convinced of the good effects of safety work, and he instanced the record of lost-time accidents for the past two and a half years in proof. In 1926 there were eighty-five lost-time accidents; in 1927, only thirty-two, and for the first six months of 1928, none.

Other instances were cited to show that the men employed in the mill had grasped the full meaning of safety and were practicing it.

The general manager of the St. Croix Paper Company had with him in attendance on the proceedings of the Paper and Pulp Section of the National Safety Council, eight men representing as many different departments of the mill, for the purpose of gathering safety ideas and taking them back to their fellowworkers.

Ranking of the Mills

George E. Burns, safety engineer, Industrial Division of the National Safety Council, who was introduced by Mr. Peacock as "the best little helper in the National Safety Council", presented detailed statistics of the ranking of all mills in the Paper Industry Annual Safety Contest. Mimeograph copies of the statement were passed around to the members. Some of the outstanding facts reported by Mr. Burns included the following:

Outstanding Facts:

1. 119 mills registered in 1927 and 124 registered in 1928. This represents an increase of 4.2%.
2. In 1927, 33,786 persons worked 43,802,604 man-hours for an average of 1,296 hours per person.
3. In 1928, 36,357 persons worked 47,673,816 man-hours for an average of 1,311 hours per person.
4. During 1927, 1,468 lost time accidents resulted in 28,396

days lost, while in 1928, 1,355 lost time accidents caused but 26,368 days lost.

5. The 1927 average Frequency Rate is 33.514. The 1928 rate of 28.422 represents a reduction of 15.2%.
6. The 1927 average Severity Rate is .649. The 1928 rate of .553 represents a reduction of 17.9%.
7. During 1928, 64 mills had a frequency rate below the average, while only 60 mills succeeded in 1927.
8. During 1928, 76 mills had a severity rate below the average, while only 58 mills were below in 1927.
9. The 1928 ratio of persons employed to lost time injuries is 27 to 1, with 19 days lost per injury. The 1927 ratio amounted to but 23 to 1 with 19 days lost per injury.
10. In 1928, the ratio of non-fatal to fatal injuries is 150 to 1, while in 1927 this was 147 to 1.
11. During the 1928 Contest, 8 mills completed the period without a lost time accident as compared with 6 mills in 1927.

Note: The points "credit" or "debit" shown in the accompanying tables were determined under the following formulae:

(A) Frequency—5 points shall be credited for each 1% reduction as compared with the average frequency rate of 35.00. Likewise, 5 points shall be charged for each 1% increase.

(B) Severity —1 point shall be credited for each 1% reduction as compared with the average severity rate of 1.00. Likewise, 1 point shall be charged for each 1% increase.

President Niesz Awards Trophies

Following this, Mr. Peacock announced that the Paper and Pulp Section was signally honored by the presence at the luncheon of Homer E. Niesz, president of the National Safety Council, who was to award the National Safety Council trophies to the winning mills.

Mr. Niesz said he was happy to be there to present the prizes to the winners of the contest. The contest section was making a real place for itself in the affairs of the National Safety Council. He complimented the St. Croix Paper Company on the methods used in their mill, which he said represented the best safety practice. He complimented the Paper and Pulp Section on having adopted the safety contest as a means of stimulating interest in the work. Other lines of industry had started similar contests more recently.

The Winning Mills

Mr. Niesz announced the standing of the winners in the three groups of mills, A, B and C. He called on Kenneth L. Faist to receive the trophy won by the Champion Coated Paper Company which stood first in group A class. The St. Croix Paper Company was first in Group B, and W. J. Brennan accepted the trophy on behalf of the company, saying that the award was the culmination of a supreme effort. The mill had tried for the trophy a year ago but bad luck pursued them, accidents seemed to spring from the ground, and he as the safety man of the mill would go to General Manager Parant and "tell another one." Mr. Parant told him to forget his failures and build upon them to try for the trophy another year. The following year the men got safety minded and came through the six months period without a single accident or loss of time. He gave all credit to the men in the mill for their devotion to the safety idea.

The prize for Group C mills was awarded to the Defiance Paper Company, of Niagara Falls, whose representative, Mr. McConnell made a neat speech of acceptance. Persistency was the talisman in safety work and for the benefit of beginners he would counsel keeping everlastingly at it. It was notable that they never got results of any account in their mill till the interest of the foreman had been aroused. He told how he succeeded in this by getting the wives of the foremen interested and arranging for meetings for foremen in their homes.

In closing, Mr. McConnell left a parting word of advice which was that the success of the seventeenth annual Safety Congress would be measured by the enthusiasm which the participants carried back home with them.

"The Paper Industry" Trophy

Edward B. Fritz, publisher of THE PAPER INDUSTRY, was then called upon to present THE PAPER INDUSTRY trophy to the mill having the best safety record for the period.

After remarking that safety or self preservation was the first law of nature, he said that an ounce of safety or prevention was worth a cabinetful of first-aid after the accident. He then gave a brief recital of the history of THE PAPER INDUSTRY trophy. He said:

"When THE PAPER INDUSTRY was started I had in mind several definite things I intended to strive for, one of which was to make every paper and pulp mill a safer place in which to work, and to cut out wastes. Wastes would be cut out to some extent if accidents were prevented, for every time there is an accident it means a waste of time and money.

"And so it was not long before we began to work with the National Safety Council. It was felt that men would be more careful if they were working for something definite and this was the beginning of THE PAPER INDUSTRY prize for the safest mill.

"Last year the major cup was not presented for the reason that at that time the rules were such that it seemed necessary for all mills to be eliminated from the contest except one. We still hold last year's cup and while we will be pleased to give this out at any time, we feel it is wonderful that three mills at least have been running since the first of 1927 without an accident.

"You have heard about the safest mill in each group for the first six months of this year. After this had been decided the judges who were to decide which mill was to receive THE PAPER INDUSTRY or major trophy went into this matter carefully and unanimously decided which mill, in their opinion, should be awarded this major prize. I therefore have a real pleasure in presenting this trophy to the representatives of the St. Croix Paper Company, of Woodland, Me.

Certificates Awarded

"There are some half dozen mills that went through the first six months of this year without an accident, aside from the mills already mentioned, and to these mills THE PAPER INDUSTRY takes pleasure in presenting certificates of merit, the first one being awarded to the Finch-Pruyn Company; the second and third to the Atlas mill and the Neenah paper mill respectively of the Kimberly-Clark Corp.; the fourth and fifth to the North Kansas City, Mo., and the Gypsum, Ohio mills respectively of the United States Gypsum Company; and the sixth to the Riley mill of International Paper Company."

Following the presentation of trophies and certificates, group photographs were taken of the officers, and of the representatives of the successful mills in the contest.

Register of Attendance

All who attended the sectional meetings of the National Safety Council at the seventeenth annual Safety Congress were requested to fill out cards giving the titles of the companies which they represented, their position on the staff of the mill and their own names, together with the name of the hotel at which they were staying during the time of the convention. Below is a fairly complete list of all who registered in this way at the meetings of the Paper and Pulp Section, during the first two days of meeting. The name of the company is given first, followed by that of the representatives in attendance.

Aetna Life Insurance Company, Hartford, Conn.—E. H. Casavant, T. J. Delaney, C. W. Geir, F. W. Hallam, Charles P. Seymour, William H. Shea, R. F. Wilson.

American Writing Paper Company, Holyoke, Mass.—Ernest R. Hare, A. S. Wilson, Arthur Wolfurd.

Armstrong Cork Company, New Brunswick, N. J.—C. C. Keef.

Bird & Son, Inc., East Walpole, Mass.—F. W. Fisher, B. D. Rogers.

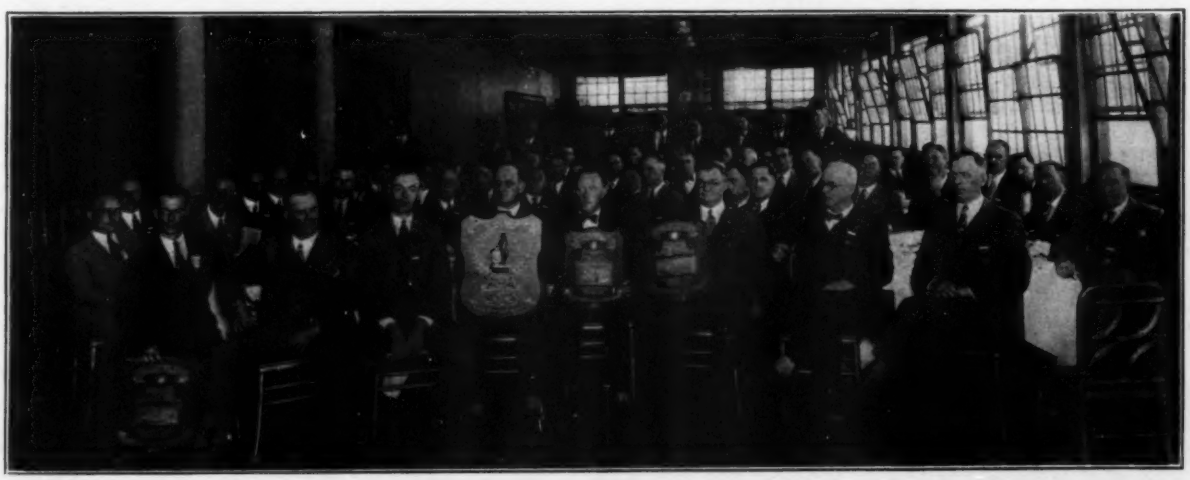
Bogalusa Paper Company, Bogalusa, La.—W. H. Jennings.
Brooklyn T. B. & Health Association, Brooklyn, N. Y.—James M. Walton.
Brown Company, Berlin, N. H.—J. M. McGivney, J. J. Tellington.
B. C. Safety League, Vancouver, B. C.—P. C. Abell.
Celotex Company, Marreno, La.—C. S. Crawford.
Champion Coated Paper Company, Hamilton, Ohio.—Kenneth L. Faist.
Champion Fibre Company, Canton, N. C.—George W. Phillips.
Container Corporation of America, Chicago—Arthur Murray.
Continental Paper & Bag Mills Corporation, New York—G. J. Adams, T. A. Reiss.
Crystal Tissue Company, Middletown, Ohio—Earl E. Grant.
De Laval Steam Turbine Company, Trenton, N. J.—F. C. Mahan.
Dill & Collins Company, Philadelphia—E. I. Raub.
Domill Construction Company, Dalhousie, N. B.—Daniel Meany.
Eaton, Crane & Pike Company, Pittsfield, Mass.—Marion E. Noble.
Elliott Service Company, New York—John B. Rapp, J. C. Youmans, Morton E. Weldy.
Employers' Liability Assurance Company, New York—Albert J. Hall.
Falulah Paper Company, Fitchburg, Mass.—George E. Ames.
Finch, Pruyn & Co., Glens Falls, N. Y.—George E. Fuller, Samuel Pruyn.
Hammermill Paper Company, Erie, Pa.—W. A. Gleason.
Hercules Powder Company, Wilmington, Del.—C. L. Jones, A. S. Kloss, Daniel Mose, J. T. Murry, F. Woodcock.
Hollingsworth & Vose Company, Boston, Mass.—Nat. S. Bartlett.
Industrial Commission of Wisconsin, Madison, Wis.—Harry F. Menzel.
Industrial Management Council, Rochester, N. Y.—G. C. Nichols.
International Paper Company, New York—Earl M. Cuglar, D. W. Eipper, P. G. Flaherty, W. E. P. Fullam, D. P. Healley, R. T. Hubbard, W. J. Kenney, E. J. Lawlor, John Lundrigan, John L. MacKenzie, C. H. O'Connell, Milton W. Price, George A. Roberts, Ross Robinson.
Johns-Manville Company, New York—L. A. Blaisdell.
Kimberly-Clark Corporation, Neenah, Wis.—M. G. Hoyman.
Larkin Company, Buffalo, N. Y.—P. H. Hourigan.
Laverack & Haines, Buffalo, N. Y.—Richard L. Slosser.
Mead Pulp and Paper Company, Chillicothe, Ohio—Ernest Augustus, L. O. Bonner.
Nekoosa-Edwards Paper Company, Port Edwards, Wis.—F. H. Rosebush.
Northern Paper Mills Company, Green Bay, Wis.—W. J. Peacock, H. W. Sherman.
Ontario Department of Health, Toronto—J. G. Cunningham.
Paper Industry, The, Chicago—Edward B. Fritz, Thomas J. Keenan.
Pennsylvania Department of Labor and Industry, Harrisburg—J. J. Coffey, Albert Karham.
Racquette River Paper Company, Potsdam, N. Y.—George W. Sisson 3d.
Scott Paper Company, Chester, Pa.—Edward J. Gayner.
Standard Accident Insurance Company, Detroit, Mich.—J. A. Leavens.
St. Croix Paper Company, Woodland, Me.—G. F. Austin, W. J. Brennan, Charles P. Bridge, Floyd L. Coons, Albertus Faloon, Frank L. Irvin, L. J. Parant, Jacob Record, C. O. West.
Strathmore Paper Company, Mittineague, Mass.—Walter Bargerin, Thomas H. Dwyer, Ira Wyman, George E. Williamson.
Technical Association of the Pulp and Paper Industry, New York—R. G. Macdonald.
Thilmany Pulp and Paper Company, Kaukauna, Wis.—W. F. Ashe.
Union Carbide Company, Sault Ste. Marie, Mich.—William Smith.
Union Bag & Paper Corp., New York—Stuart H. Brown.
United States Aluminum Company, Edgewater, N. J.—E. L. Packard.
Warren Manufacturing Company, New York—F. L. Triggs.
Wisconsin Industrial Commission, Madison—R. G. Knutson.

Millions of Currency in Paperboard

Schmidt & Ault Paper Company, York, Pa., recently came into possession of more than a million dollars in Confederate paper currency, which has since been converted into paperboard.

The story is that in rebuilding the home of a trust company in Lancaster, Pa., it was necessary to rid the vaults of all excess papers and records. Among the old ledgers were found more than a million dollars in bills issued by the Treasury of the Southern Confederacy during the War of the Rebellion. It was found impracticable to destroy the notes by burning them, so an arrangement was made for the disposal of the "junk" to the Schmidt & Ault Paper Company.

The contract stipulated that the records, cancelled checks, ledgers and Confederate currency be placed in sealed bags and shipped to York in sealed cars. Officials of the bank were present when the papers were reduced to pulp at the Schmidt & Ault plant.



Luncheon of Paper and Pulp Section, National Safety Council, Waldorf-Astoria Hotel, New York City, October 3, 1928

Northeastern Superintendents Meet

There was a very large attendance at the fall meeting of the Northeastern Division of the Pulp and Paper Mill Superintendents' Association at the St. Johnsbury House, St. Johnsbury, Vt., on Friday and Saturday, October 5 and 6. Every mill in Vermont, New Hampshire and Maine was well represented and the speakers at the business meeting were John J. White, paper specialist, of Holyoke, who gave a very interesting talk on the relations between printers and papermakers and drew attention to the difficulties of the printers, which are sometimes blamed on the paper used instead of on some other factor that affects the job in hand. He urged closer co-operation between printers and papermakers in order to secure maximum results in both industries.

C. Scholdebrande, of the G. D. Jenssen Company, New York, covered the subject of pulp manufacture very thoroughly and showed stereopticon views of various phases of handling pulp wood, the cooking of chips and other operations in pulp manufacture.

Thomas H. Ireland, of the Crane Company, spoke interestingly on the use and installment of piping in paper and pulp mills and answered questions concerning the best method and pipe for the many requirements of pulp and paper mills.

After the speakers, an hour was devoted to questions and answers of problems in connection with the manufacture of pulp and paper and some interesting facts were brought out for the benefit of those in attendance.

In the evening on Saturday a banquet was held, with fifty-six members and wives present. C. A. Brautlecht, chairman of the Northeastern Division, presided as toastmaster at the banquet and National President Ben Larrabee gave a very fine talk on the benefits of the association, at the same time urging all present to do their utmost to further build it up.

John White, of Holyoke, gave an exceedingly interesting account of his experiences in other industries, and Peter Murray from the Keith's Circuit entertained with songs and stories.

After the banquet, dancing was enjoyed until midnight and brought to a close one of the most successful meetings the Northeastern Division has had.

New officers were elected at the meeting as follows: president, Herbert Stanley, Parker Young Co., Lincoln, N. H.; vice presidents, Wm. A. Cape, S. D. Warren Co., Cumberland Mills, Maine; H. J. Deamond, Keyes Fibre Co., Waterville, Maine; J. A. Harlow, Penobscot Chemical Fibre Co., Old Town, Maine; secretary-treasurer, A. C. Cloudman, S. D. Warren Co., Cumberland Mills, Maine.

On Friday afternoon a golf tournament was held at the St. Johnsbury Golf Club. Twenty-one members strove to win the two beautiful silver cocktail shakers which were donated by the Crane Company. The low net prize was won by Lyman Smith, of the Crown-Zellerbach Co., and the low gross by E. J. McDonnell, of the Groveton Paper Co.

Increasing Production of Belt Driven Machines

A new material—Pulleystone—applied to the surface of iron, steel, or wood pulleys is claimed will give them an efficiency equal to or better than that of a new paper pulley. A pulley covered with a thin coat of Pulleystone is claimed to take hold of the belt as will no other pulley surface and without abrasion. It increases the output with all types of belting—leather, rubber or canvas, etc.

Applied to a large engine lathe, Pulleystone practically doubled the cut and doubled the machine's output. Applied to a large iron planer in the same plant it materially increased the output.

The increase in production output comes primarily from the elimination or reduction in belt slippage. When a belt driven machine is new, the drive (with leather belts) has an efficiency of 98 per cent or higher. But as bearings, belts, etc. wear or as the speed of machine or load is increased beyond what the equipment was purchased to do, slippage develops. On used equipment, Pulleystone is claimed to bring the efficiency up to 98 per cent with existing equipment which results in speeding up the production.

Pulleystone is a plastic material that comes only in 20 lb. cans. It spreads over the pulley with the hand and is then smoothed off with the back of the hand dipped in warm water. The surface is then smooth enough to give a very high adhesion. This adhesion increases with service. It can be applied quickly and by any one. It provides a pulley surface guaranteed to give the claimed results. The surface is permanent. It is sponsored by the Chicago Belting Company, 113 North Green Street, Chicago, who are sole distributors for the United States.

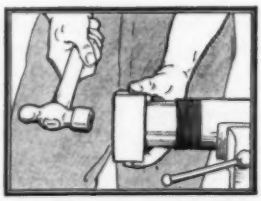
Pipe-Savers Increase the Life of Pipe

Pipe in the pulp and paper industry serves as one of the most important means through which materials can be transported. Water, sulphite acid, soda and sulphate cooking liquors, bleach liquor, waste sulphite acid, sulphur dioxide gas, black liquor, white water, pulp and paper stock in dilute suspension in water. alum solutions, rosin size, steam, compressed air, milk-of-lime, caustic soda, soda ash solution, etc., are only a few of the major materials commonly conveyed in a pulp and paper plant through pipe lines.

Pipe maintenance, therefore, becomes a very important item in the final determination of production costs. To decrease this maintenance cost and to increase the life of the pipe is the function of the pipe-saver, a simple and inexpensive device, recently put on the market by the Pipe-Saver Corporation of America, Carthage, N. Y. This has been placed on the marekt only after several years of experimentation, much of which has taken place in paper and pulp mills, and after the real benefits of its use were determined.

Worn end of iron pipe

Pipe-Saver



Seating a Pipe-Saver with block of wood held against flange

The pipe-saver is a piece of tubular metal made of an alloy that is resistant to the action of the piped materials. It is designed to fit inside the ends of any standard size pipe, and to cover the ends of the pipe with a flange thus protecting the threads of the pipe and reinforcing the pipe ends.

Savings in the use of the pipe-savers accrue from decreased cost of replacement pipe, added protection against leaks which often prove expensive, less frequent shut-down for repairs if process work demands it, and decreased labor costs for taking down leaky pipes and replacing with new. The life of brass pipe in one sulphite acid plant installation, for example, has been increased several times through the use of pipe-savers. In another installation where pipe wore out frequently, pipe-savers have resisted wear for three and a half years and when examined after this service seemed in every respect as good as new.

Pipe-savers are easily inserted into the ends of a pipe. After the pipe is reamed, as all pipe should be before installation, the pipe-saver is dipped in oil and then inserted in the end of pipe. The pipe-saver is seated by placing a block of wood flat against the flange and striking with a hammer.

Samples and literature will be supplied on request by Pipe Saver Corporation of America, Carthage, N. Y.

New Mill of Taggart Bros. Co., Inc.

Paper Mill and Bag Factory Ideally Situated on Shore of Lake Ontario

OSWEGO, old in the history of our country, figured largely in the Colonial Wars, and to some extent in the Revolutionary War. Its unusual location made it a desirable spot for early settlement and for development into an important industrial center. For a number of years, however, little impetus was given to new industry and Oswego failed to grow as rapidly as many of her neighboring towns. In fact, Oswego to the observer seemed dormant. Today there seems to have been an awakening, a rebirth of activity, and a number of new industries have recently had their beginning in Oswego.

One industrial plant that comes into the ranks as a new enterprise is that of the Taggart Bros. Co., Inc. This plant is controlled by the St. Regis Paper Co. interests of which Mr. F. C. Carlisle is president. It has been built to manufacture paper of such quality that it may be converted into multi-walled bags for handling cement or other rock products. The paper produced in the plant is, likewise, converted into the finished bags in the bag plant which is an integral part of the entire unit.

Geographically, Oswego is situated on the south shore of Lake Ontario at the mouth of the Oswego River and in the State of New York. By some it is considered as the most important American port on the lake. The site of the mill is in the proximity of the lake as well as that of Old Fort Ontario. Fort Ontario is said to be the oldest garrisoned fort of North America.

With the location of the mill being close to the lake, it becomes easy to supply the plant with one of the primary materials necessary for production—a good supply of water in sufficient quantity for all process work. At present the paper mill consumes about 2,000,000 to 2,500,000 gallons of water daily. This water is supplied to it through two 36-inch mains which lead from the lake into the pump house from which the water is pumped into the mill.

The site upon which the mill was located offered no unusual conditions to deter construction. Good bearing surface for concrete foundations was obtained about 5 or 6 feet below the basement floor level. The walls of the plant were made of two piece concrete block construction with the framework of structural steel for columns, floors, etc. A specially designed block, as illustrated on page 1221, was used for the walls to permit not only easy architectural handling but also to supply an air chamber of good size between the exterior and interior wall surfaces. The thickness of the wall totaled approximately 10 inches.

All floors were made of reinforced concrete. The roof was built of 3-inch yellow pine matched lumber. This roof rests upon wooded purloins which in turn are supported by steel girders. An insulating board was laid above the roof boards, between the roof boards and the Johns-Manville built-up roof. This insulation was made particularly heavy over the machine room to prevent any tendency of "drip" caused by condensation upon the inside of the roof.

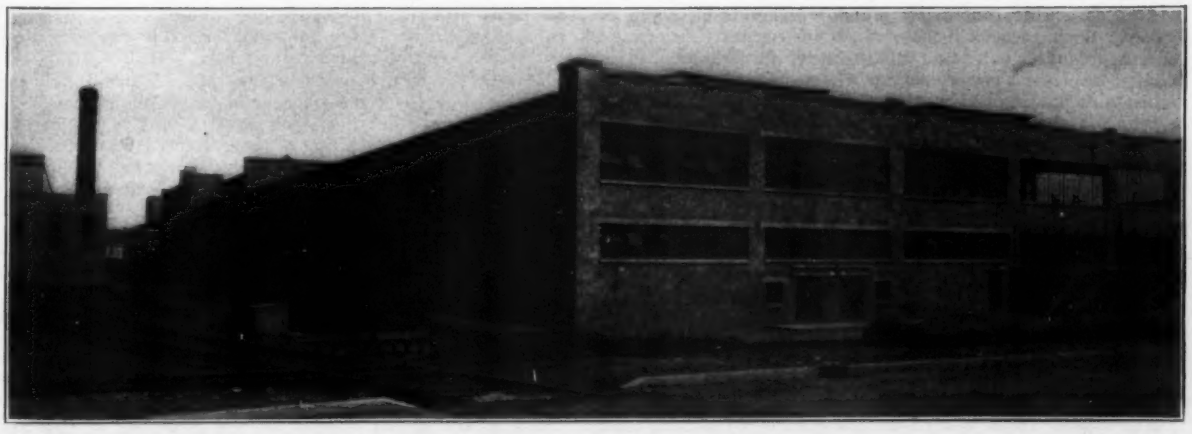
Lighting

In the design of the mill buildings, as much window area as possible was utilized. This feature was to increase the benefit of natural lighting upon the working space. Approximately 30,000 square feet of steel sash were used in the building.

The direct system of artificial lighting was used throughout the factory proper, while indirect lighting was used for the offices. Benjamin R. L. M. reflectors with capacities ranging from 75 watts to 300 watts were used to direct the light to the work area. The intensity of light over the work area was determined for a point four feet above the floor. The quantity of light available at this height throughout the plant through artificial illumination was given as follows:

	Operating floor.
Bag Factory	10 foot candles
Basement	6 " "
Beater Room	10 " "
Circuit Breaker Room	6 " "
Electrical Shop	8 " "
Machine Room	8 " "
Over winder and around stack	12 " "
Machine Shop	12 " "
Office	7 " "
Power House	8 " "
Storage	4 " "
Store-room, Mill Supplies	8 " "
Switch Board Room	8 " "
Toilets and Wash-rooms	7 " "

The interior walls from ceiling to about four feet from floor, and the ceiling, were painted a cream color to increase the reflection of the light. The lower four feet of wall surface was painted an olive green. Such a color combina-



General view of plant of Taggart Bros. Co., Inc., Oswego, N. Y. Right—addition to bag factory in process of construction

tion pleases the eye and makes for efficiency in both artificial and natural lighting.

Sanitation

Considerable thought in the design and layout of the building was given to the comfort of the workers. Wash-rooms, toilets, drinking fountains, etc. were located conveniently around the plant. Such facilities have produced excellent working conditions and will aid in maintaining satisfactory working efficiency from all employees.

A first aid room in charge of a registered nurse was located on the main floor of the paper mill. This room has been completely equipped with apparatus suitable for performing any minor operation and for handling all first aid. Instruments and drugs suitable for this work stored in a convenient cabinet, an electrically heated instrument sterilizer to insure sterile instruments for each case, a dressing table fully equipped, special lamp, desk, adjustable stool, and several all metal chairs, waste receptacle, and operating and examining table are only the major items of importance in equipping this department.

Records are kept of every injury whether it be major or minor. Such records include name of employee, age, sex, address, department, date of accident, foreman, cause of injury, treatment given and by whom. Telephone communication is maintained with every department of the mill.

Immediately adjacent to the first aid room are two other rooms both of which open into the first aid room. The smaller of the two rooms is a rest room. This room has been made very attractive. Part of the furnishing of the room include a rug for the floor, comfortable wicker chairs, and a Da-bed. The second room has been set aside as the women's cloak room. This room has been equipped with suitable racks and hangers for cloaks and wraps, benches, and special compartments for lunches or other small packages or bundles.

The nurse in charge of first aid work also acts as matron to the women employees. The location of the various rooms thus aids in making her work easier.

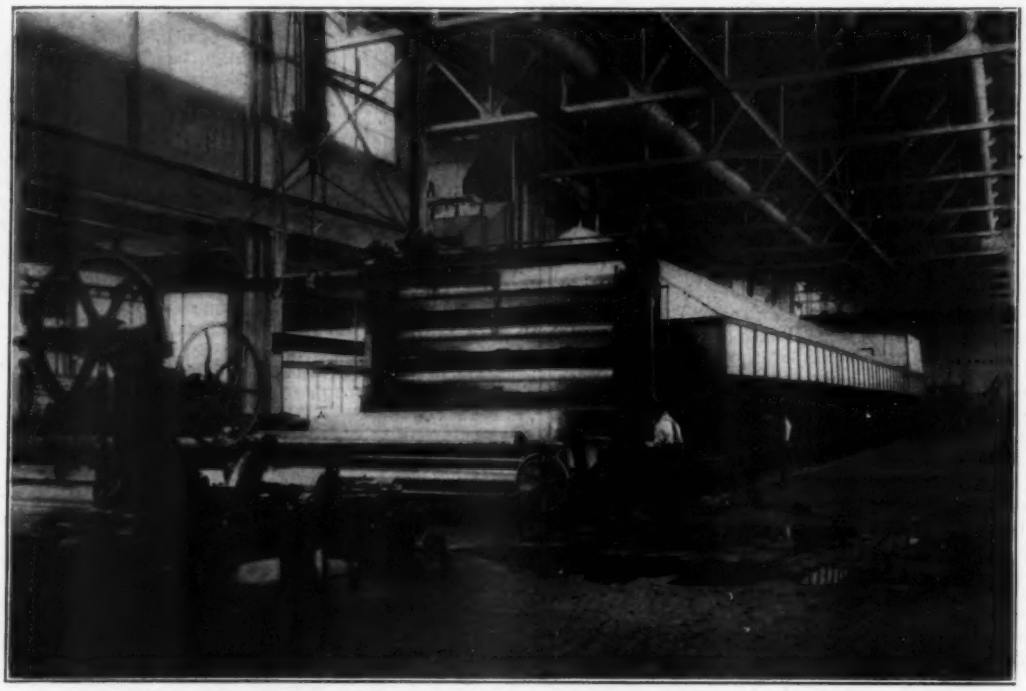
Beater Room

The beater room located on the north end of the main building has a floor area of approximately 20,000 square feet. The dimensions of the room are 85 feet in width 240 feet in length.

Upon this floor area are neatly arranged, with plenty of room about each machine, a Mitts & Merrill pulp shredder, fourteen 2,000-pound E. D. Jones High Density beaters, 2 Majestic jordans, and an Oliver Continuous filter.

The Mitts and Merrill shredder is fed with kraft pulp from storage, the storage room being immediately adjacent to the beater room but on the floor below. The pulp is elevated to the shredder on a Jeffrey wood apron conveyor with a travel speed of about 50 feet per minute.

The shredder has a capacity of 8 tons per hour of dry kraft stock. It is directly connected to a 150 h.p. motor operating at 865 r.p.m. The shredded pulp drops by gravity into the shredder chest where water is added and where hydration begins and overflows into the hydration chest from which the stock is pumped to beaters.



The 168" Bagley & Sewall paper machine in mill of Taggart Bros. Co., Inc.

The beaters are arranged in two parallel rows, seven on a side, and have the front side of the tubs next to the center aisle. All beaters are belt driven through individual electric motors. The beater rolls in each of the beaters are 53 inches in diameter by 60-inch face. The speed of the rolls approximate 147 to 148 r.p.m. Each beater is equipped with an octagonal cylindrical washer.

Due to the requirements of the finished bag, it is necessary that the stock receive careful attention in the beaters. It is necessary that the stock be hydrated to a point that will give the final quality of sheet desired when fabricated on the paper machine. When the stock has been beaten to the desired point as determined by test it is dropped to the beater chest.

From the beater chest the stock is pumped through two Majestic jordans, the weight of the stock fed to the jordans being controlled through a consistency regulator. The jordans are arranged in tandem with each jordan directly connected to a 400 h.p. synchronous motor. After the stock has passed through the jordans it is discharged to the machine chest.

At this point, it might be well to digress a little and to mention briefly the type of chests used for storing paper stock.

All of the chests, located in the basement of the paper mill, are of reinforced concrete construction. The chests

semble somewhat a beater tub but are of very large size. With each chest equipped with a mid-feather and special agitating equipment located near the bottom of the chest, it is possible to circulate the stock uniformly throughout the entire mass. The agitating equipment consists of cast iron 4-blade propellers with a 48-inch outside diameter. These

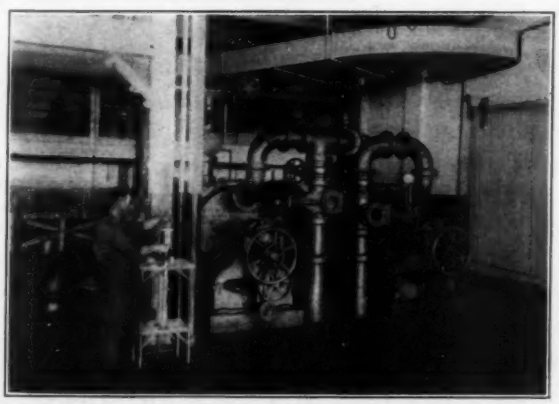
View of beater room

propellers revolve inside cast iron rings which are set in the concrete baffle walls. The drive shafts of the various drives extend through the chest walls with combined packing glands and ball thrust bearings. Each of the units are directly connected to an electric motor through flexible coupling and Cleveland Worm and Gear speed reduction units to develop propeller speed of 116 to 120 r.p.m.

The Oliver filter, located near the Mitts & Merrill pulp shredder in the beater room, has a filter drum 8 feet in diameter with a 12-inch face. The drum is placed in a steel tank and the operating unit designed for 60 per cent of drum submergence. A 50-mesh phosphor bronze wire has been used for the facing wire. This wire is bound in position on the drum with silicon bronze wire.

Working in conjunction with the filter is a filtrate pump of 1000 g.p.m. capacity. The pump is designated as an Oliver Pelton spiral pump.

The filter installation has been designed to handle the excess water from the paper machine, and to return the



Jordan installation showing piping arrangement

clarified white water to the clarified white water chest for reuse in the paper mill.

Machine Room—Paper Machine and Auxiliaries

The major equipment of the machine room consists, in brief, of four No. 2 Bird screens of latest design, an auxiliary screen, and the paper machine. Because of the size of this equipment and in line with the non-crowding idea of the beater room, the machine room is 66 feet 9 inches in width by 324 feet in length.

The Bird screens located side by side at the north end of the room are pedestaled upon a concrete foundation. The four units are driven through De Laval speed reduction gears which operate from a shaft connected to a single motor. The installation is compact, neat, and operates most satisfactorily.

The rejects from the Bird screens are discharged to a belt driven auxiliary screen unit which consists of a 12-plate diaphragm screen. The screened stock from the auxiliary unit gravitates into the wire pit of the paper machine, while the tailings flow to the sewer.

The stock from the machine chest is pumped to a consistency regulator located on the back side of the paper machine which proportions the stock flow to the stock pump supplying the rotary screens. The balance of stock from the regulator returns to the machine chest. The stock from the rotary screens flows into the head box of the paper machine.

The Paper Machine—The paper machine is a 168-inch Bagley and Sewall fourdrinier of most improved design. From

One of the centrifugal pumping installations
Stock chest in rear

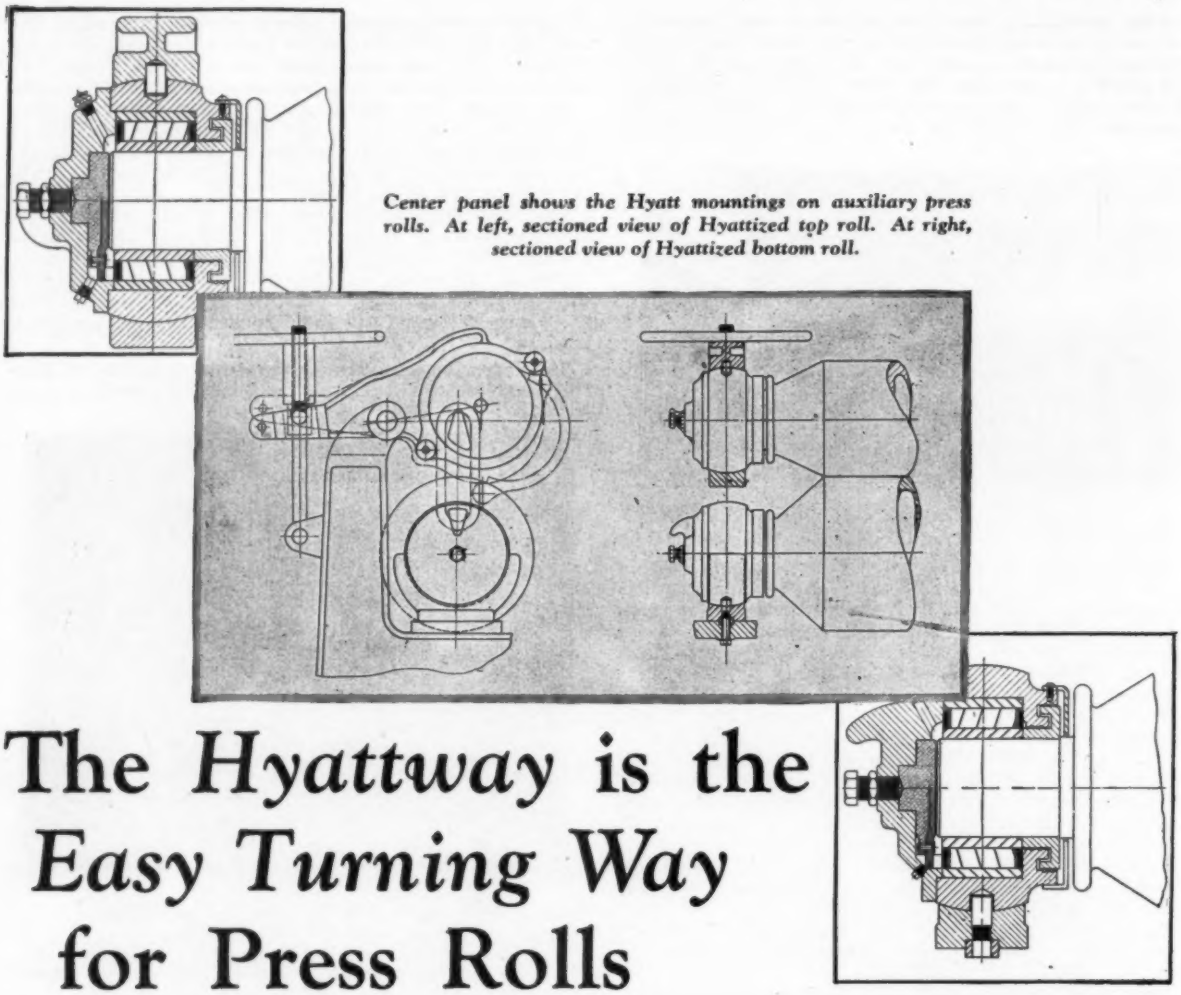
the head box to the winder end of the machine are features of interest to the paper machine operator.

The wet end is designed to run a level wire and is equipped with a 36″-high slice constructed to permit the machine to be operated from 600 to 800 feet per minute. The wire itself is 75 feet in length by 168 inches in width. The apron board is of metal to eliminate any tendency of warping or other troubles which are experienced with other materials. Naturally, this board must be fitted with end fixtures to accommodate the high slice. These fixtures are of brass. A Wentz "No Deckle" device supplies the means of controlling the width of sheet on the wire.

The breast, wire, table, guide, stretch, couch, and felt rolls and drum of uniform speed reel are supported by anti-friction roller bearings. The press rolls are carried on self-aligning ring-oiling bearings and are arranged for water cooling. The dryer bearings are phosphor bronze lined and are double ring oiled. A large oil well and self aligning features are also provided. Anti-friction roller bearings are used for the steam joints. The calender roll bearings are ring-oiled, water-cooled, and brass lined. The drums of the two-drum winder are carried in roller bearings. Special anti-friction bearings are also used in the driving arrangement.

A 30-inch Millspaugh suction couch roll and a 30-inch Millspaugh suction bottom press roll are part of the machine. In addition to the two suction rolls, the machine is equipped with seven easily removable flat boxes with hard maple covers. These boxes may be oscillated longitudinally by motor drive.

In addition to the Millspaugh suction press are two regular presses; the first two presses, including the suction press, operate straight ahead. The sheet is reversed at the third press. A rather novel installation of a Sheahan rope carrier is made on this press. The press is equipped with ropes for



Center panel shows the Hyatt mountings on auxiliary press rolls. At left, sectioned view of Hyattized top roll. At right, sectioned view of Hyattized bottom roll.

The *Hyattway* is the *Easy Turning Way* for Press Rolls

Main press stand rolls, when mounted on Hyatt Roller Bearings, turn so easily that an even tension is maintained on the paper at all times.

Thus uneven stretching, and the resultant breakage of the paper is obviated.

Free turning Hyatt Roller Bearings eliminate lubrication trouble and water cooling which is necessary with plain bearings.

Hyatts serve further by reducing the tension and wear on felts of the "baby" or primary press sections . . . *saving time and money.*

When necessary to change felts it is easier to make the change with Hyatt mountings on the machine than if plain bearings are used. And with Hyatts in their oil tight housings there is less chance of getting grease on the felts.

No matter which way you look at it, the Hyatt way is the Right Way. Our engineers will gladly explain any anti-friction application in which you are interested.

HYATT ROLLER BEARING COMPANY

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HYATT

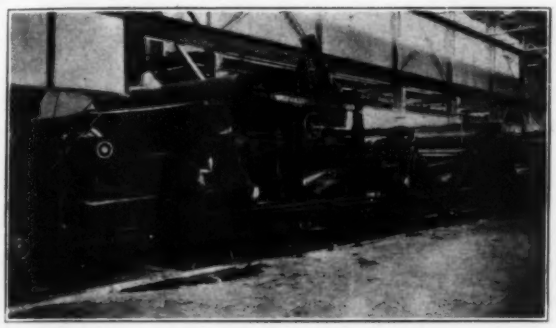
ROLLER BEARINGS

PRODUCT OF GENERAL MOTORS

carrying the paper automatically through the press to the carrying ropes of the dryer section.

The second and third bottom press rolls are each 26 inches in diameter and are rubber covered. The first top press roll, the top roll of the suction press, is 22 inches in diameter and of granite. The second and third top press rolls are, likewise, of granite but are 24 inches in diameter.

Each of the press felts are approximately 54 feet in length with the felt arrangement made to permit the sheet to be

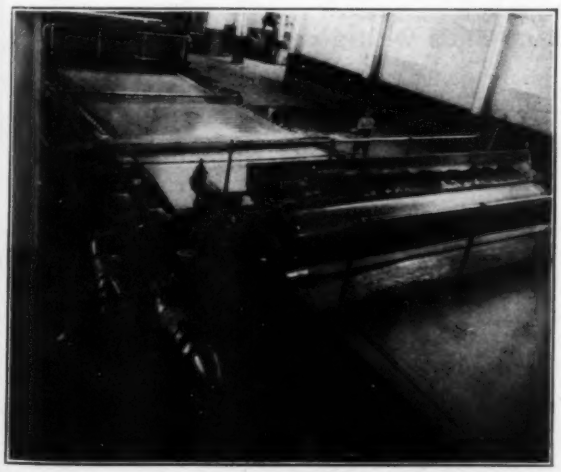


The press part. Note Sheehan rope carrier on third press

reversed at the third press. A suction box is located on the first felt back of the press.

Vacuum Pumps—The vacuum requirements of the wet end of the machine are met through the installation of several Nash vacuum pumps. A flat box unit located in the machine room basement under the wire pit of the machine serves the seven flat boxes of the machine. This unit, including vacuum pump, centrifugal pump, receiving tank, and connecting piping, is directly connected to a 65 h.p. General electric synchronous motor operating at 250 r.p.m. The operating unit has a rated capacity of 1500 gallons of water per minute and 1160 cubic feet of air per minute at 10 inches of vacuum at 250 r.p.m.

The vacuum pump connected to the suction couch roll of the machine is also located in the basement. It is installed under the press pit of machine. This pump is directly connected to a synchronous motor of 80 h.p. capacity operating at 220 r.p.m. The pump capacity is rated at 1810 cubic feet



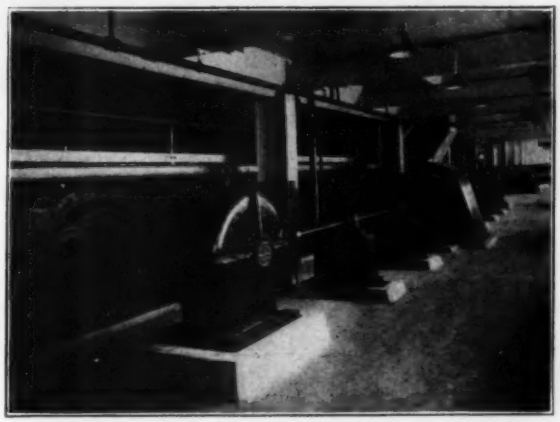
Wet end of machine. Note suction couch and press with connections

of air per minute at 12 inches of vacuum when running at motor speed.

A pump of smaller capacity, 1192 cubic feet of air per minute at 12 inches of vacuum, is installed on the 30-inch suction press roll. This pump is located near the vacuum pump section couch roll installation in the machine room basement under the press pit of machine. As in the other installations, this unit has been directly connected to a synchronous motor. A motor of 50 h.p. and an operating speed of 257 r.p.m. has been used. A still smaller unit supplies vacuum to the felt suction box on the first press of the machine.

Dryer Section—The dryer part is made up of forty 60-inch diameter dryers, four 48-inch felt dryers and one 36-inch baby dryer arranged in two tiers or double deck. Each dryer has a 168-inch face. The 60-inch dryers are bored to insure uniform thickness.

The dryers are arranged in one section but the last top dryer which is arranged for cold water shower is driven independently of the other dryers in the section. The entire dryer section is equipped with a Sheahan automatic paper carrier, and, as mentioned previously, the dryers are equipped with anti-friction roller bearing steam joints. These joints permit more accurate determination of syphon pipe location



Drive side of machine showing method of driving

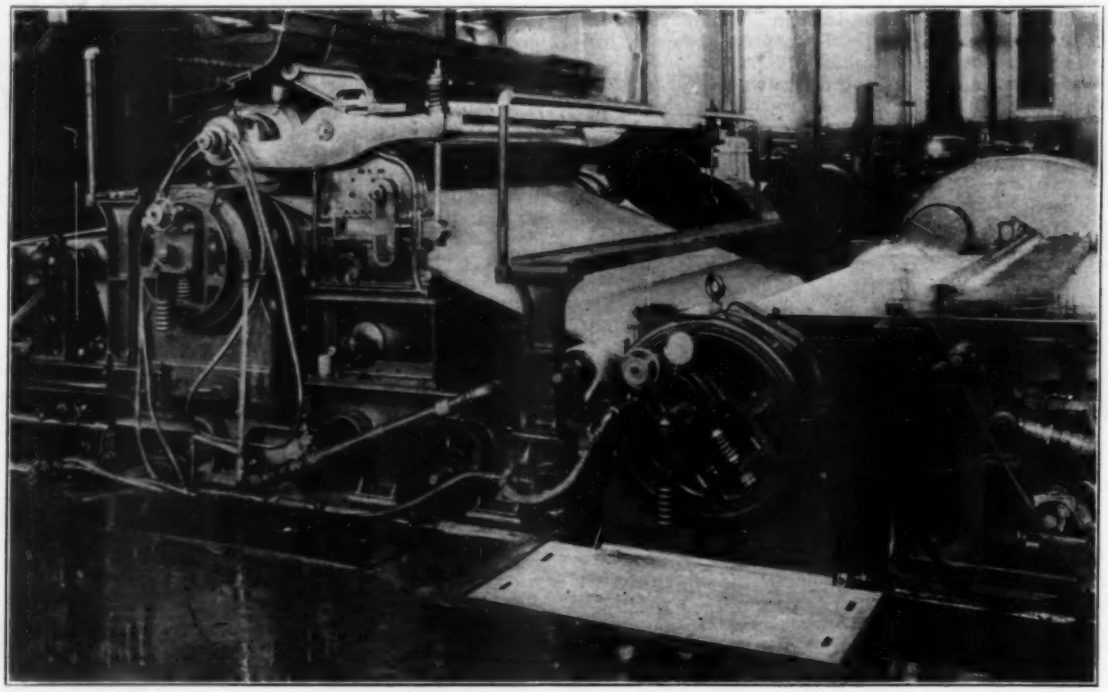
within the dryers and the syphon pipes may be raised or lowered as desired from the outside. A number of the dryers are also equipped with doctors, thus insuring clean dryer faces and most economical drying.

The dryer section of the machine is equipped with both Stickle's automatic steam control and drainage systems. The steam control system is dependent upon the variation in draw of the paper between the dryers near the dry end of the machine. The action of the regulating device is governed by the expansion and contraction of the paper as it passes over a tension roll. When the sheet of paper draws upon the tension roll, a pilot valve opens and admits auxiliary pressure to the bottom of a piston. The upward movement of the piston closes the exhaust steam valve by means of a chain and weights. In case additional steam is required by the dryer section, the pilot valve would close and open with the change in tension of the sheet and would admit only sufficient steam for proper drying.

The drainage system for the dryers is designed to automatically maintain a difference in pressure between the steam supply header and the return header on the machine. A Jennings dryer exhaust unit is combined with this system. It receives the condensate from the system and pumps it to the feed water heater located in the boiler room.

Other Auxiliaries—Other auxiliary equipment to the dryer section includes a complete Bowser oiling system for the dryer bearings. This equipment consists of an oil storage tank, gravity feed tank, oil filter tank, several oil pumps, and special pipe fittings and sight feed glasses. This installation supplies a uniform flow of clean oil to the bearings at all times.

A hood is used over the dryer section of the machine. The hood is made up with steel framework in panels which are covered with ¼-inch Transite and insulated with asbestos. It is 23 feet wide x 131 feet 4 inches long x 9 feet 8 inches high and is equipped with two exhaust connections.



Specifications for the new machine at Taggart-Oswego Paper Co., Oswego, N. Y. called for Millspaugh patent Suction Rolls, including 30″ diameter suction couch and 30″ diameter suction press

These are equipped with our heavy duty, shoe type self aligning bearings, which are being run in many mills with great success

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Above illustration shows a typical installation of Millspaugh Suction Couch and Suction Press Rolls in another modern newsprint mill

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Ask for our latest bulletin, No. 505

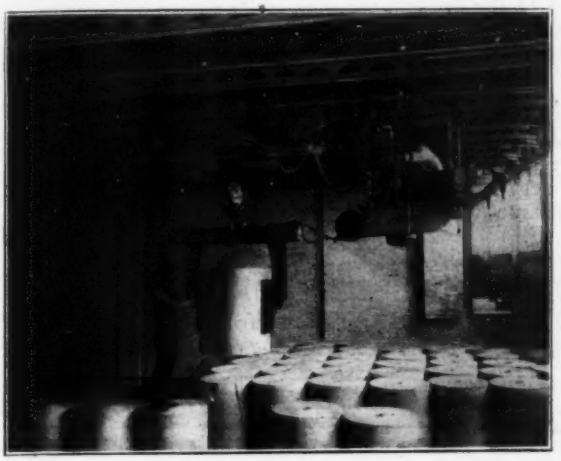
THE PAPER & TEXTILE MACHINERY CO.

Sandusky, Ohio

A Briner economizer installation is connected to each of the two exhaust openings in the hood. Exhaust fans take the hot moist air from the hood and pass it through the two economizers where it is condensed. In giving up its heat, this moisture laden air increases the temperature of fresh air which is supplied to the economizers by heating fans.

The calender is an eight-roll stack supplied with Farrel rolls. The bottom roll is 28 inches in diameter, the next to the bottom roll is 20 inches in diameter and the remaining six rolls are each 14 inches.

The calender rolls are cooled through a B. F. Sturtevant Blower Unit which is suspended on a platform under the machine room floor. A galvanized iron pipe and system of nozzles permit the cool air to be blown upon the rolls by the blower.



Method used in handling roll paper

The uniform speed reel has a drum 42 inches in diameter and has a worm and spur geared arrangement for lifting the rolls. The winding stand is supplied with a special water cooled braking device. A crane located over the reel and winder end of the machine takes the jumbo roll from the reel and places it upon the winding stand. This crane is equipped with an air hoist lift and permits the operators to accomplish this task most easily.

The paper from a jumbo roll on the stand is fed through a slitter of low type design equipped with a 15-inch slitter drum and Koegel ball bearing type slitters. The paper slit to desired widths is then wound into rolls of convenient size upon a Bagley and Sewall high speed two drum winder from which it is removed to storage.

Drive Arrangement—A description of this machine would not be complete without mention of the drive arrangement. Each section of the machine is driven through its individual drive.

Each drive consists essentially of bevel gear arrangement, totally enclosed in an oil tight gear case, and a pinion shaft upon which is located a completely guarded cone pulley. Power from the line shaft located in the basement of the mill is transmitted through belts to each of the cone pulleys in the entire drive and brought by an indriving shaft to the machine through the bevel gear arrangement. Cutler-Hammer magnetic clutches with electrical control for operating are used with the drive. All electric controls for starting and stopping the various sections are located on the tending side of the machine. This drive is neat, functions smoothly, and permits ready access to the drive side of the machine. Roller bearings are on the floor cone driving shafts and on the entire line shaft.

Cranes

Several cranes were installed in the machine room to facilitate maintenance work and to handle finished rolls of paper at the dry end of the machine. The main machine room crane spans the full width and travels the full length of the machine room. This crane is of the double I-beam, geared, hand traveling type with capacity of ten tons. The crane is equipped with two 5-ton geared overhead carriages and two 5-ton high speed hoists. A crane was also located over the fourdrinier section of the machine. This crane was designed to travel on two 12-inch I-beams which are hung from the roof trusses. The travel distance of the crane is approximately 90 feet—from the north wall of machine room to a point just beyond the suction roll. This crane has a capacity of 4 tons. A third crane, also traveling on two 12-inch I-beams, was installed over the reel, winder, and slitter. This crane has a travel distance from the south wall of the machine room to a point over the last two top dryers of the machine, a distance of approximately 72 feet, and has a capacity of 2½ tons. Although other cranes were installed at various places in the plant, these cranes constitute the hoisting equipment pertaining directly to work about the machine. They were supplied by Chisholm-Moore Hoist Corporation.

Water Supply and Stock Pumps

The pumping requirements of the mill have for the most part been met by the installation of Kingsford Foundry and Machine Co. centrifugal pumps. Installation of these pumps range from the pump house installation for fresh water supply to the clarified white water pump. Three 8-inch double suction centrifugals, each with a capacity of 2100 g.p.m., are installed to supply the mill with fresh water. Two side suction top discharge pumps with a rated capacity of 800 g.p.m each are used to pump the stock from the hydrated stock chest to beaters. One of these pumps is installed as a spare to eliminate any possibility of shut-down because of pump failure. The pumping installation between the beater chest to the jordan installation has been made in the same way. Two pumps have been installed with one of the two standing-by for spare. Each of these pumps have a capacity of 600 g.p.m and are of side suction top discharge type.

Paper rolls in storage

The stock and white water pump to the rotary screens is a 12-inch double suction centrifugal with capacity of 2000 g.p.m. This pump is connected to a water leg from the wire pit and with a stock pipe from one of the consistency regulators. The pump discharges the stock and water mixed

Firing aisle at the Taggart Oswego Paper & Bag Corporation, Oswego plant. In addition to the large ducts normally carrying pulverized coal to the furnaces, a smaller connection is included for each boiler. This is used for carrying light loads and standby service.

Aero Unit Pulverizers at Taggert Oswego Paper and Bag Corp.

Two Aero Unit Coal pulverizers are installed in the new plant of the Taggert Oswego Paper & Bag Corporation at Oswego, N. Y. These machines are used for firing two 516 hp. Kingsford Webster boilers. Powdered coal is fed directly from the Aero units to the boilers, eliminating the storage of pulverized fuel. The pulverizers are designed for continuous boiler operation at 250 per cent rating and will develop a maximum peak load capacity of 300 per cent.

A single Foster economizer, used with the two boilers raises the temperature of the feed water to 285 deg. F. at a pressure of 225 lb. per sq. in., at the same time reducing gas temperature to 304 deg. F.

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Giving the Beaters a Lift

Conveyor or Gravity Feed Shredder

In the new mill of Taggart Bros. Co., Inc., Oswego, New York, one MITTS & MERRILL SHREDDER having a capacity of eight tons of dry stock per hour, shreds kraft pulp and discharges the stock by gravity into the chest where it is agitated until needed for the beaters.

The MITTS & MERRILL SHREDDER through it's economical method of preparing stock for the beater contributes much to the completion of the beater's work in the shortest possible time, thereby cutting down operating costs and speeding up the process of paper making.

MITTS & MERRILL SHREDDERS are built in sizes with spouts ranging from 18" to 45" wide. We will be glad to quote you on any size adapted to your requirements.

It gives the beater an economical lift.

MITTS & MERRILL
1013 Tilden Street, Saginaw, Mich.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse

See pages 364 and 365 in the 1925 Paper and Pulp Mill Catalogue

to the system of Bird screens for screening prior to formation into sheet on paper machine.

The pump which supplies the stock regulator with stock from the machine chest is a 6-inch side suction top discharge unit with a diagonally split casing. It has a capacity of 650 g.p.m. A side suction top discharge centrifugal with diagonally split casing and a capacity of 1100 g.p.m. has been installed to pump white water from the white water chest to the beaters, shredder, and Oliver filter, while an 850 g.p.m. centrifugal is used for pumping the clarified white water for the showers on the paper machine. This unit is a double suction type with horizontal split casing. A small 2-inch pump with a capacity of 80 to 90 g.p.m. has been installed to pump emulsified size from the size tank to storage tank in the beater room. All of these pumps have been installed in the basement or first floor level of the paper mill.

In addition to this installation of centrifugals is a special Oliver Pelton spiral pump of 1,000 g.p.m. capacity to pump the filtrate from the Oliver filter to the clarified white water tank together with a single plunger pump of approximately 60 g.p.m. capacity for pumping broke beater stock to beater chest.

All of the pumps are directly connected to electric motors. The centrifugals have sealed bearings of either Timken or deep groove radial ball bearing types. The casings are split to permit the pump units to be dismantled without disturbing either the suction or discharge piping. A special hand hole opening in the covers of the stock pumps permits ready access to pump suction. Every precaution seems to have been taken to elimate any chance for disrupted service in the operation of the plant.

Store Room

The store room for paper, located between the machine room and the bag factory, extends from the basement floor level to the roof with no floor at machine room floor level. This room is 60 feet in width by 101 feet long.

The rolls of paper in storage are piled end on end thus giving very large storage capacity. A most interesting installation of Cleveland Electric Tramrail equipment makes it possible to place the paper in storage and to remove from storage with greatest ease.

A very elaborate and yet simple installation of overhead track permits the cab and carrier to travel practically above any of the various rows of paper rolls in storage, thus permitting the hoist and specially designed grab to function advantageously. The operator in the cab has control over the grab as well as the entire movement of the hoist and carrier. Such an installation of conveying equipment certainly facilitates the handling of paper and tends toward neatness in storing.

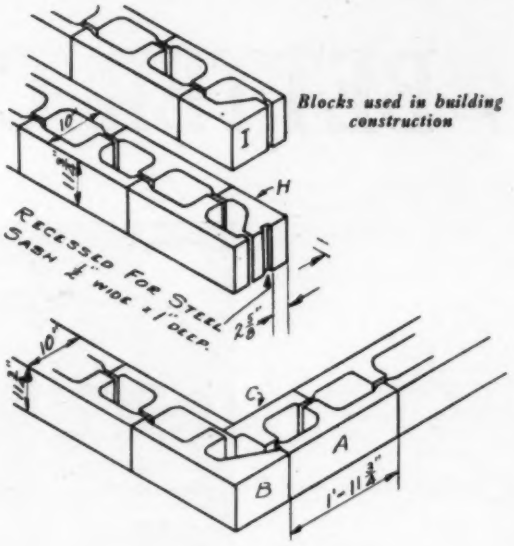
Other Important Units

In addition to the equipment already described are several other units of importance to smooth functioning of the plant. A Dilt's broke beater has been installed in the machine room basement under the paper machine and near the calender foundations to handle all broke. An Ingersoll-Rand air compressor has been located in the machine room basement to supply compressed air throughout the plant. This compressor is direct connected to a synchronous motor. The compressor has an air capacity of 568 cubic feet at full load and discharges at a pressure of 100 pounds. A Farrel left-hand roll grinder, 32 inches by 172 inches, equipped with full motor drive has been located in the northeast corner of the machine room. This grinder has been set on a special reinforced concrete foundation which is entirely independent of the building construction. Such an installation makes it possible for the grinder to operate without any effect of vibration for other operating equipment. Several Toledo scales are located at points throughout the plant for convenient weighing of materials. A gravity sprinkler tank of 50,000 gallon capacity has been located near the lake shore and to the northeast of the plant. The steel tower supporting the tank is 100 feet high. This installation forms an auxiliary water supply since the sprinkler system of the plant has been arranged to function on city water pressure.

On the basement floor level and immediately adjoining the east wall of the machine room basement are located stock room, machine shop, and electrical shop and storage room. The floor area covered by these various rooms approximates 288 feet in length by 39 feet in width. The machine shop alone is approximately 126 feet long. It is equipped with such tools as are commonly used for maintenance and repairs around a paper mill. The major equipment of the shop is composed of several lathes, a milling machine, several grinding machines for shredder knives, slitters, etc., bolt cutter, combined power punch and shear machine, several pipe threading machines—one with pipe capacity from 2-inch to 12-inch, drill presses, wet tool grinder, and shaper.

Power

The boiler plant designed, for the most part, to supply steam for drying of paper upon the paper machine is housed



TYPICAL CORNER

in a separate building of the same general type and construction as that of the main plant. The outside dimensions of the building housing the boiler plant are 65 x 53 feet.

The equipment of the plant consists essentially of coal handling machinery, pulverizing units, and the boilers including furnaces, chimney, feed water heater and auxiliary equipment, such as pumps, for operation and control.

The coal handling equipment was supplied by Robins Conveying Belt Co. Two Aero pulverizers, each with a rated capacity of 6,000 pounds of coal per hour, are used to pulverize the coal. These units are located on the operating floor of the boiler plant and in operation are designed to reduce 80 to 85 per cent of the coal to a point that it will pass through a 100-mesh wire. One pulverizer is located in front of each of two boilers and is driven by a 75 h.p., 1200 r.p.m. induction motor.

The furnace of each boiler is 10 feet 10 inches wide by 18 feet deep inside with a furnace volume of 4250 feet. Detrick furnace walls, sectionally supported and air cooled, are backed by 8 inches of red brick.

Near the top of each furnace in the front furnace wall are located two large burners and one auxiliary burner. These burners incline downward at an angle of approximately 45 degrees. The large burners are used for heavy load demands and the small burner for light loads. About 60 to 70 per cent of the air for combustion enters the furnace with the coal at the burners.

The direction of gas flow is controlled by a series of dampers and baffles. The flue gases from the boilers are discharged into a short duct which directs the flow of gas to the breaching or to the economizer.

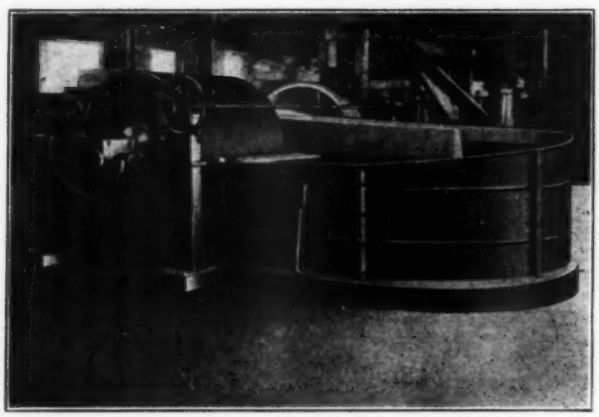
The economizer, a Foster unit, has 3024 square feet of

"Your Paper is made in your Beaters"

NEW TYPE

HIGH DENSITY

BETTER CIRCULATING



THE PROBLEM is "how to beat *more* stock into *better* quality with *less* cost for labor and power."

THE ANSWER is "the Dilts New Type, High Density, Better Circulating Beater, built with high tub and with the roll located toward the rear end."

We could rebuild your Beaters to our NEW TYPE design—

Dilts
MACHINE WORKS, Inc. FULTON, N.Y.
EXPORT OFFICE - 15 PARK ROW - NEW YORK CITY

"Your Paper is made in your Beaters"

external heating surface. It is located in the rear of one boiler with the breaching and gas ducts arranged so that the economizer may be operated with either boiler. A double suction Sirocco fan furnishes the induced draft when operating the economizer. The Sirocco fan discharges into the breeching and from the breeching the gases are discharged into an Alphons Custodis radial brick chimney. This chimney is 125 feet high above the foundation and is 8 feet 6 inches inside diameter at the top.

The two boilers were manufactured by Kingsford Foundry and Machine Company. Each boiler has a rated capacity of 513 h.p. and is of the cross drum water tube type. The tubes of No. 9 gauge are 4 inches in diameter and 18 feet in length. The bank of tubes is 13 high and 18 wide. The boilers have been built for 225 pounds gauge pressure, and are equipped with Diamond Soot Blowers, Copes Feed Water Regulators, and Bailey Recording and Integrating Meters.

As mentioned previously, most of the steam produced in this plant is used for heating the dryers of the paper machine. Small quantities of steam are used for heating the building, for operating boiler house auxiliaries, heating water for showers, etc. In few instances, uses for small quantities of steam are found in the bag mill.

All steam entering the mill is at approximately 220 pounds pressure. This steam passes through a General Electric turbo-generator set from which it is exhausted at 6 to 12 pounds pressure to the dryers. The turbo-generator set, when the plant is in full operation, should be able to provide approximately 600 k.w. of power.

Electrical power for equipment operation is purchased from the Northern New York Utilities. This power is delivered at the mill at a pressure of 44,000 volts. This current is stepped down through two banks of transformers with an aggregate capacity of 6,500 K.V.A. to 2,300 and 550 volts. It is then ready for use in the plant.

All D.C. current required in the plant is produced through a suitable motor generator set from the 2300 volt system.

The lighting system and a few small motors on machine tools use 220 and 110 volts. This current is stepped down through distributing transformers which are located in the basement of the mill.

Bag Factory

The bag factory operating as a continuous system consists of an extensive layout of automatic equipment specially designed and built for this plant.

Briefly, the process of making the bags consists of three major operations. The first operation involves the use of tubers on which the various plies of paper are brought together in a long tube, printed on both sides, gusseted, and cut to length. The second operation forms the self-closing valve while the third manufacturing operation binds the bag in process with gummed tape and sews both ends at the same time thus making the complete bag.

Every individual bag is inspected at this point before bundling. After bundling into parcels of convenient size for easy handling, the bags are ready for shipment.

Some appreciation of the extent of the bag making operations may be obtained when it is stated that the capacity of the bag plant is 350,000 multi-walled bags per eight hours. Likewise, to meet seasonal demands and to make for steady operation throughout the year, a storage warehouse with storage capacity of 200 carloads of finished bags has been built as an integral part of the bag plant.

As mentioned previously, this plant is controlled by the St. Regis Paper Company interests of which Mr. F. C. Carlisle is president. Mr. E. E. Whitney served as manager of the enterprise during the days of construction but since the plant has been placed into operation the active management has been turned over to Mr. C. C. Jewell, general manager of the St. Regis Paper Co., with offices at Watertown, N. Y.

The chief engineer during construction was Mr. Ray W. Shaver. He was assisted by Mr. F. L. Benchley, mechanical engineer, Mr. R. F. Crandon, architectural engineer, and Mr. A. O. Mortenson, electrical engineer.

Thanks are due to Mr. C. C. Jewell for the privilege of describing this plant, and to Messrs. Benchley, Crandon and Mortenson for their helpfulness and kindness in giving information about the technical aspects of construction, as well as Mr. D. A. Fleischman, general manager of the bag plant and W. L. Campbell, paper mill superintendent, and others who so cheerfully gave of their time to make clear any questions pertaining to the operation of the plant.

Shipping finished bags

Charge Paper Manufacturing Monopoly

The Department of Justice has filed in the United States Court for the Northern District of New York, at Albany, a petition against the Alden Paper Co., Unity Paper Mills, Inc., Hopper Paper Co., American Writing Paper Co., Edward S. Alden, William R. Smith, Frank P. Barry and Matthew Burns, charging a violation of the Sherman Act in the sale of union-made watermarked paper.

It is proposed by the action to put an end to the union-made watermarked paper monopoly which is alleged to have been created as a result of a conspiracy between William R. Smith, Frank P. Barry and Matthew Burns, officers of the International Brotherhood of Paper Makers, and Edward S. Alden, a paper broker of Holyoke, Mass.

The dandy-rolls used for the purpose of watermarking paper, are owned by the brotherhood; and paper makers, including American Writing Paper Co., Holyoke, Mass.; Unity Paper Mills. Inc., Potsdam, N. Y.; and Hopper Paper Co., Taylorville, Ill., have entered into an arrangement whereby Alden Paper Co., owned by Edward S. Alden of Holyoke, Mass., is designated as exclusive distributor for all union-made paper. The Government demands a nullification of all arrangements making Alden's company the exclusive distributor of the union-made product.

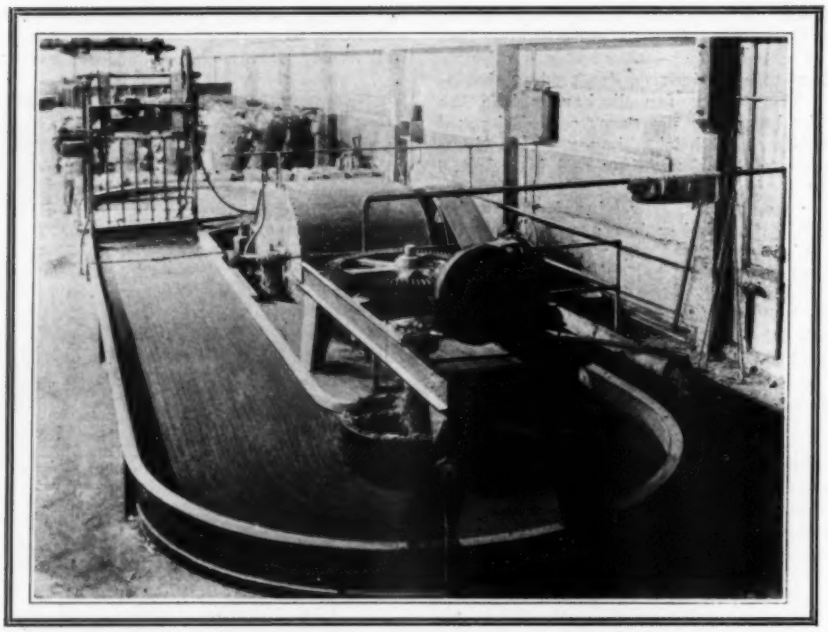
International Paper and Power Co. Now Effective

The plan for the formation of International Paper and Power Co. as a holding company for the properties of International Paper Co. became effective October 1.

Under the plan, 7 per cent preferred stock holders will receive 7 per cent preferred stock of International Paper and Power Co. share for share carrying rights of conversion into Class A common stock. Common stockholders will receive three shares of common stock of the new company, one each of the three Classes, A, B and C.

International Paper and Power Co. is expected to acquire control of the extensive power and distributing systems of New England Power Association, the largest utility organization in the New England States, and upon acquiring control will have a capitalization of about $550,000,000.

Waterpowers developed and under construction of International Paper Co. and New England Power Ass'n with their subsidiaries amount to over 1,300,000 horsepower, capable of being increased through further development and utilization of underdeveloped sites to a total of over 2,600,000 horsepower. In addition the New England Power Association system owns and operates about 382,000 horsepower of steam electric capacity.



BOARD MILLS—*Lower Your Production Costs with* Valley Breaker Beaters

—and lower your costs on so many items of production that Valley Breaker Beaters will earn for you their cost many times over—while at the same time increasing your production and keeping your stock uniform.

Valley Breaker Beaters develop marked improvement in the stock and permit constant supervision of raw materials at one source. Thoroughly separating foreign materials from the stock, Valley Breaker Beaters are quick mixers and rapid disintegrators. They reduce steam and power consumption—those factors that so definitely affect production costs.

Further savings are made because there are few replacements of fly bars, bed plates, jordan plugs and fillings.

The perforated revolving extractor (shown in the foreground in the above installation view) insures quantity production, as it permits self-cleaning of the extractor during the entire period of beating. It maintains the correct rate of stock discharge—insuring clean and free stock in large amounts. That's why the beater illustrated above is producing 100 tons of board stock per day.

Let us tell you more about Valley Breaker Beaters—complete details on request. Write today.

VALLEY Equipment Includes

Beaters: Holland and Niagara
Deckers: Single and Double
Agitator Equipment
Screens: Flat and Rotary
Pumps: Centrifugal and Stuff
Cylinder Paper Machines
Voith Stock Inlet
Laboratory Equipment
Stock Valves: 2 and 3 Way
Stock Consistency Regulators
Beater Rolls and Fillings
Digester Fittings of all Kinds

VALLEY IRON WORKS CO.

Machinery for Paper and Pulp Mills

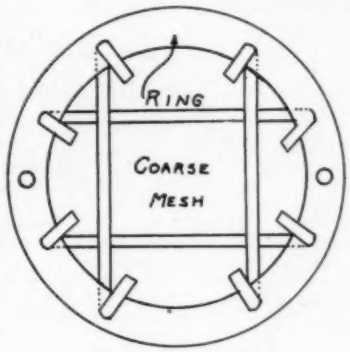
APPLETON WISCONSIN

New York Office: 350 Madison Avenue
Western Manufacturing & Sales Division: Smith & Valley Iron Works Company
Portland, Oregon

Practical Helps for the Mill Man

A Simple and Inexpensive String Catcher.

IN A LARGE paperboard plant a simple and removable string catcher was designed for each beater. Each string catcher consisted simply of a flat steel ring of slightly larger diameter than the discharge opening in the bottom of the beater tub, four short pieces of approximately ⅜" diameter steel bars, and one longer piece of round steel of about the same diameter. The rim of the ring was sufficiently wide to permit eight holes to be drilled at points that permitted the short lengths of steel to be attached to the ring in the form of a coarse rectangular mesh covering the opening of the ring. Two additional holes, located conveniently in the ring but directly opposite to one another, were used to attach the longer piece of round steel which had been previously bent into a nicely shaped handle. The handle was sufficiently long to reach a convenient distance above the height of stock in a beater tub. In operation, as soon as the valve of a beater was pulled, a string catcher was set immediately over the valve opening. All stock must pass through the coarse mesh of the string catcher. Strings and other undesirable material were retained on the device. After the tub had been emptied of stock, the catcher was removed and cleaned, thus being made ready for the next dumping operation.



STRING CATCHER (TOP)

Detector for Vacuum System Leaks

THE detection of small leaks in an installation of process equipment which operates under vacuum is frequently not easy to accomplish. In a recent issue of Chemical and Metallurgical Engineering the use of oil of peppermint or other extremely volatile and oderiferous material was suggested. A cloth saturated with the material and placed over the leak would allow the odor of the volatile material to in-leak into the vacuum system when it could be easily detected at the atmospheric discharge of the system. A short time interval should elapse between applications at various joints or points of possible leakage to allow the vapors to pass through the system if leakage existed at the point of application.

Reducing Labor Costs in Rag and Beater Rooms

A ROOFING-FELT mill superintendent was confronted with the problem of reducing labor cost per ton in the operation of the rag room and beater room of the mill. The layout of the mill was such that the rag room was located on the floor directly above the beater room. After a careful study of the installation, it was found advisable to relocate the rag cutting and conveying equipment in such a way that the rags should pass through the rag cutters in tandem, and then be conveyed along the rag room floor directly above the beaters. An individual hopper was designed to connect each beater with the rag conveyor and thus each beater could be filled automatically by gravity.

In addition to the relocation of the rag cutting and conveying equipment was the installation of a signal system to facilitate the operation of the whole scheme. In this system is included a combination lighting and electric horn circuit with a three-way switch conveniently located to each beater and with the lights and horn on the rag room floor. The circuit is arranged so that the first turn of any signal button sounds the horn to notify rag cutter operators to begin work; the second turn of a button operates the lighting circuit and by means of a red light designates beater to be filled; the third turn of the switch again sounds the horn signalling rag room workmen that beater in question is filled. In addition to this circuit is a secondary light circuit which is controlled by a switch located conveniently on the beater room floor. The function of this circuit is to inform the rag room workmen whether equipment which they are operating is to be shut down or to be continued in operation. This system of conveyors together with the signal arrangement has meant a material reduction in labor cost per ton.

Checking Time on Intermittent Machine

The paper mill operator is chiefly used to continuous process machines whose efficiency he judges by their being able to run continuously without trouble and by the tonnage they produce in twenty-four hours. So, when he has to deal with a guillotine cutter, or a sheet cutter, or a super-calender or any intermittent service machine, he is sometimes at loss for a means to check its efficient use. Obviously, it is necessary to stop to move full trucks away and empty ones near the guillotine cutter. Even with a double deck, some time is lost in changing from one deck to the other on a sheet cutter. Rolls must be changed on the super-calender.

The paper mill man who is contemplating buying an extra unit of these machines would find a Servis recorder a profitable investment. This little device, manufactured by the Service Recorder Co., Cleveland, O., was first largely used on motor trucks to determine how long the truck was actually in motion. Place one of these on an intermittent service unit and determine the exact amount of idle time. Then devise ways to cut down the time it takes to supply new trucks to a guillotine—or switch decks on a sheet cutter—or change rolls on a super-calender. After that, it may no longer be necessary to buy another unit.

I. P. Co. Awarded U. S. Govt. Contract

International Envelope Corp., a subsidiary of International Paper Co., has been awarded the contract for supplying the U. S. Post Office Department with twelve billion eight hundred million stamped envelopes and newspaper wrappers for the four year period commencing January 1, 1929. International Envelope Corp. was the lowest bidder with a bid of $13,209,793, which was $105,000 below the bid of the present supplier.

The paper will be supplied by International Paper Co. and the envelopes will be made by International Envelope Corp., in which it is understood the Standard Envelope Manufacturing Co. of Cleveland has an interest.

This contract is another step by International Paper Co. towards diversification of products. The company has grown from a $100,000,000 company in 1924, when its principal product was newsprint, to the proposed $550,000,000 company which will come into existence when the new holding company, International Paper and Power Co., is formed and takes over the additional New England Power Association stock. More than half of the new company's assets will be public utility properties and the balance well diversified, including plants producing newsprint, writing and book paper, envelopes, sulphite pulp for rayon, sanitary napkins, wrapping paper, bags, cement sacks, wall board, mulch paper, and many other products.

Solve Your Pipe Problems With

The most economical pipe on the market that has proved its durability through long years of service.

Sizes 6″ to 30″ diameter asphalted or galvanized.

ROOT Spiral Riveted Pipe has ever so many advantages for conveying fresh water above or below ground to pulp and paper mills, as well as for process work in such mills.

AN ABSOLUTELY TIGHT DURABLE PIPE

50% Stronger Than Straight Riveted Pipe

One-third the Weight of Wrought Pipe
One-fifth the Weight of Cast Iron Pipe

The lap riveted seam which repeats its cycle every twelve inches forms a broad stiffening rib of great value. *Root pipe is fully one-third stronger than any other type of pipe of equal thickness.*

Light weight and simple connections reduce transportation, handling and erecting costs.

Cutting Down Dead Weight—The high load-efficiency of the single helical riveted seam reduces suspended pipe weight inside the paper mill by at least two-thirds, *minimizing load stress problems and cost of overhanging lines.*

CATALOGUE

Our 96 page catalogue includes a brief non-technical description of many diversified applications of Root Pipe. Copy will be mailed upon request.

In Service since 1884 —still good for 45 years

Forty-Four years ago, the Lexington Water Co., Lexington, Mo., equipped its entire water system with Root Spiral Riveted Pipe, aggregating 88,000 feet. This system operates at 110 to 125 lbs. at pump station and 70 lbs. in the town. In 1927 Mr. R. E. McDonnell of the well known water works engineering firm, Burns & McDonnell, Kansas City, Mo., inspected this pipe at various points throughout the town and reported *Everything indicates that the remaining useful life of the pipe is 45 to 50 years.* The illustration shows a specimen of the force main of this installation it was necessary to remove due to the construction of the new bridge in 1924. Note the slight deterioration and incrustation after 42 years of continuous underground service.

Specimen of Lexington, Mo., water supply line, after this 14-inch, Root-made pipe had been down 42 years

Great Strength, Light Weight, ease of installation, durable coatings and low frictional resistance all contribute to the popularity of Root Pipe in the pulp and paper field.

Abendroth & Root Manufacturing Co.

The 60-year-old standby of the Paper Industry

General Sales Office: Woolworth Bldg., New York, N. Y. Works: Newburgh, New York

Profit and Loss in Fiber Utilization

By C. M. BAKER

Engineer, American Paper and Pulp Association

AN ANNUAL saving of $5,261,615 in fiber utilization is commendable, but a potential loss of $6,389,167 annually is deplorable, and should focus the attention of every mill executive and official on ways and means to convert this loss into a profit. The foregoing figures are conservative estimates based upon data obtained from questionnaires sent out to the industry last December, and to which 46 per cent of the total tonnage replied. The profit and loss in the different grades is shown graphically in the accompanying diagram and given in detail in Table VI.

Six years ago the Technical Association of the Pulp and Paper Industry appointed a committee on wastes which has published some excellent reports and valuable information in the various journals and publications. R. B. Wolf, chairman of this committee in 1922 stated:

> "The fiber loss per 1000 gallons of white water going to the sewer is of course influenced by the volume of water per ton of paper. Under good operating conditions this should not exceed an attainable standard of 0.5 of a pound per 1000 gallons, and in the manufacture of some grades of paper should be even less."

That these results are being secured is indicated by answers from a number of the mills, white water losses of less than 0.5 of a pound per 1000 gallons being reported in several instances. Mr. Wolf also stated:

> "The production of all grades of paper in the United States for the year 1922 was practically 7,000,000 tons. Even one per cent saving at an average figure of $30 per ton represents a saving of over $2,000,000. A conservative estimate indicates that an average reduction of 5 per cent of the waste water losses is possible."

His estimates thus indicated an annual saving of $10,000,000. G. D. Bearce, chairman of the committee in 1926, stated:

> "The estimated average loss throughout the industry divided into grades is approximately as follows: Wrapping, 5 per cent; news, 7 per cent; tissue, 10 per cent; board, 10 per cent; and book, 15 per cent. Assuming that it takes 110 tons of furnish to produce 100 tons of finished paper, and that 80 per cent of the excess furnish is recoverable, the amount of paper making material that can be reclaimed is 8 tons per day. If the stock is valued at $40 per ton, it represents a loss of $320 per day, or approximately $100,000 per year."

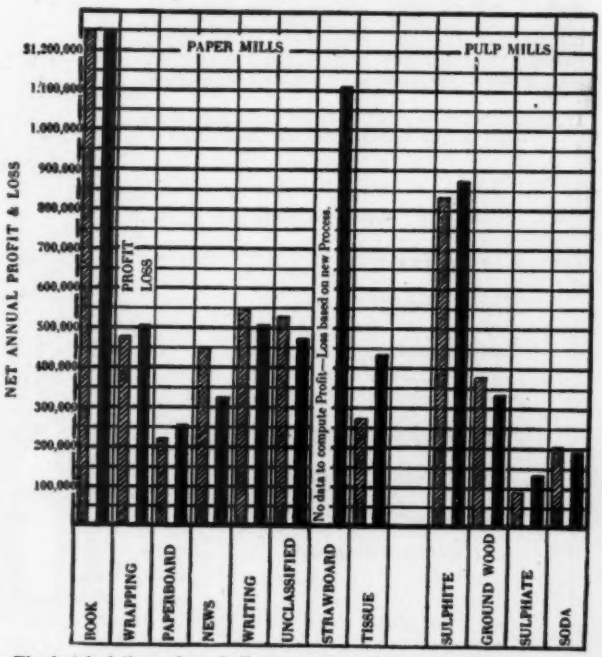
These statements and estimates are corroborated by the more recent questionnaires. Although it is probable that considerable progress has been made since, there still is much to be done.

Basic Data

The figures given in the opening paragraph of this article, and to be presented and discussed more in detail, are based upon questionnaires sent out in December, 1927, in which information was requested regarding expenditures made for white water utilization and the results obtained therefrom. While the replies were in many cases incomplete, an abundance of data was presented on which to base computations of actual savings and losses. Some mills reported the actual expenditure for equipment, while others indicated the type of equipment installed, but gave no actual expenditure; some reported the actual financial return from the installation, while others reported the recovery of so many pounds or tons of fiber, or stated that the fiber losses had been reduced so much per 1000 gallons of waste, but failed to indicate the total volume of wastes. Furthermore, the data presented usually consisted of total figures for the mill, or sometimes group of mills, as a unit without regard to grades, so that in making classifications it has been necessary to apportion the results to the different grades. Because of the incompleteness of the data it has therefore been necessary to make certain assumptions as follows:

1. In adjusting the expenditures and returns to the various classifications or grades, the expenditures for equipment and installations to recover and utilize waste fiber have been considered directly proportional to the daily tonnage capacity, but the returns have been weighted in proportion to the value of the recovered material.
2. The assumed value of materials per ton has been as follows: Book, wrapping, and tissue, $40; news and unclassified, $25; writing, $60; strawboard and paperboard, $20. Pulp values have been taken as sulphite and sulphate, $40.00 per ton; soda, $45; and groundwood, $15.
3. Where fiber losses or recovery have been given per 1,000 gallons it has been assumed the volume was 20,000 gallons per ton of product.
4. In computing net returns or losses, 25 per cent of the original expenditure has been allowed to cover interest, overhead, operation, etc.
5. In mills not reporting it has been assumed that their efficiency in fiber utilization is 25 per cent. This is less than the mills reporting, but it is probable that the more efficient mills have reported more completely.

Diagram of Profit and Loss in Fiber Utilization



The hatched lines above indicate *profit*, and the solid lines *loss*, for the various grades.

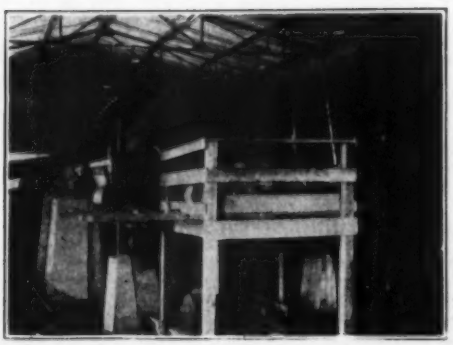
The total net annual profit to the pulp and paper mills of the United States in the utilization of fiber is estimated at $5,262,000 while the value of fiber now lost which might be recovered through practical and economical processes is $6,389,000 annually.

Computation Methods

Data furnished by mills considered efficient in fiber utilization and of such completeness as to permit resaonably accurate determinations, have been used to compute unit figures as a basis for determining the savings and losses, where essential information was lacking. The method of computation and tabulation is indicated in Tables I, II, and III, for book mills. In Table I, Column No. 1 contains numbers assigned to the mills for reference. The next column gives

When you are planning this Equipment think of

MANITOWOC

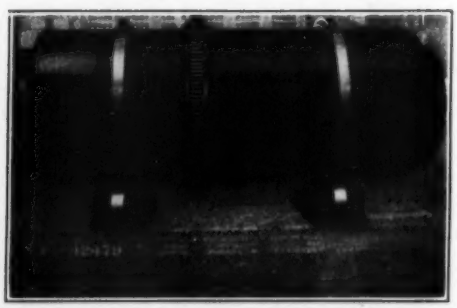


Installation of 10 x 30 Paulson Barking Drum —one of the installations in 23 mills.

Experimental Digesters
Disc Evaporators
Cylindrical Rotaries
Globe Rotaries
Relief Separators
Bleach Mixers
Refiners,
in addition to the three illustrated here

Clay Mixers
Blow Pipes
Rod Mills
Lime Kilns
Moore Speedcranes
Moore Speedshovels,
in addition to the three illustrated here

Manitowoc Digester—one of the installations built for 104 sulphite mills.



Manitowoc Incinerator ready for shipment and one of the Incinerators now serving 32 pulp mills.

Your inquiry on this equipment is solicited

MANITOWOC ENGINEERING WORKS

MANITOWOC, WISCONSIN

the estimated daily tonnage capacity of the particular mill for book, the third, the amount expended for fiber utilization, and the fourth and fifth, the return upon the investment. Below the table, allowance is made for interest, overhead, and operation, and the net annual saving determined. The expenditure and net annual saving per ton of daily capacity were then computed. These figures were used for computing the data in Tables II and III, where the information available from the questionnaires was insufficient.

The first five columns of Table II present data for the inefficient mills reporting, similar to that in Table I for efficient mills. Columns 4 and 5, however, are largely computed from the average gross per cent return indicated in Table I. In Column 6 a percentage of inefficiency, based upon the type of equipment and other data furnished by the questionnaires, is assigned to the mill, and from this the "Inefficient Tonnage Equivalent" indicated in Column 6 is computed. Below, the 25 per cent allowance for interest, overhead, operation, etc., is deducted, and the net annual saving determined. To this is added the saving for efficient mills from Table I, thus giving the total net saving for mills reporting. The total inefficient tonnage equivalent multiplied by 490, the net annual saving per ton of daily capacity for efficient mills from Table I, gives the net annual loss due to inefficiency in mills reporting.

In Table III the data from Tables I and II are used in computing the information for all book classification. Under Item No. 1 is given the per cent of total tonnage replying to the questionnaires, in No. 2 the estimated per cent efficiency in fiber utilization, and in Item No. 3 the estimated total net annual saving and loss for all book mills.

Table I

Computation Methods

Classification—Book

Mills Reporting Efficient Utilization

Mill No.	Daily Tonnage Capacity	Total Expended	Return on Investment	
			Total	%
27½	86	$ 2,880	$ 46,400	1,570
184	37	21,000	24,000	114
187	60	6,280	11,580	184
89	161	7,250	58,000	800
102	100	32,740	12,000	37
112	42	20,000	28,200	141
167	70	5,320	42,200	792
169	450	254,200	314,000	123
208	40	11,000	62,200	611
Totals	1,046	$360,670	$603,580	167
Less 25% of expenditure for interest, overhead, operation, etc.			90,168	
Net annual saving for mills reporting			$513,412	
Expenditure per ton of daily capacity			$ 345	
Net annual saving per ton of daily capacity			$ 490	

Table II

Computation Methods

Classification—Book

Mills Reporting Inefficient Utilization

Mill No.	Daily Tonnage Capacity	Total Expended	Return on Investment		Inefficiency	
			Total	%	%	Ton. Eqv.
14	12	0	0	0	100	14
...	350	$ 5,000	$ 8,350	167	50	175
32	100	5,000	8,350	167	80	80
178	20	12,000	20,000	167	25	4
52	280	0	0	0	100	280
56	33	1,870	3,120	167	33	11
66	18	3,000	5,010	167	50	9
185	60	21,100	35,200	167	10	6
101	595	167,000	279,000	167	25	149
113	30	1,000	1,670	167	60	18
114	35	0	0	0	100	35
118	84	85,700	143,000	167	0	0
126	35	36,800	4,100	11	0	0
134	17	0	0	0	100	17
161	65	9,050	15,100	167	20	13
205	20	4,864	8,110	167	50	10
Totals	1,750	$352,384	$531,010	151	...	824
Less 25% of expenditure for interest, overhead, operation, etc.			88,096			
Net annual saving for mills reporting			$442,914			
Net annual saving for efficient mills			513,412			
Total annual saving			$956,326			
Net annual loss due to inefficiency of mills reporting 824 x 490=			$403,760			

Summary Data

The detailed data for book mills discussed above are presented to illustrate computation methods, and, while similar data were prepared for all classifications, they are not included in this paper. The data for all classifications, however, are summarized in Tables IV, V, and VI. In these tables, also in the diagram showing profit and loss and to which reference has previously been made, the grades or classifications are arranged in the order of total valuation of product.

From Table IV for efficient mills it will be observed that the amount expended per ton of daily capacity for individual mills ranged from $55 for paperboard to $345 for book mills, while for all the figure was $141. For pulp mills the range was from $95 for groundwood to $240 for sulphate, and $143 for all pulp mills. For both paper and pulp mills the expenditure per ton of daily capacity was $142. The net annual return per ton of daily capacity ranged from $56 for paperboard to $690 for tissue, being $230 for all paper

Table III

Computation Methods

Classification—Book

Estimated Total Financial Return & Loss in Fiber Utilization

1. Total daily tonnage capacity of all book mills		5,070
Total daily tonnage capacity mills reporting efficient utilization (Table I)	1,046	
Total daily tonnage capacity mills reporting inefficient utilization (Table II)	1,750	
		2,796
Total daily tonnage capacity mills not reporting		2,274
Percent of total tonnage reporting 2796/5070=		55%
2. Assuming an efficiency of 25% in mills not reporting		
Efficient tonnage equivalent mills not reporting		568
Efficient tonnage equivalent mills reporting 1046 (Table I) + (1750-824) (Table II)=		1,972
Total efficient tonnage equivalent		2,540
Total inefficient tonnage equivalent		2,530
TOTAL % EFFICIENCY=2540/5070=		50%
3. With net annual saving per ton of daily capacity		$490
ESTIMATED NET ANNUAL SAVING IN ALL BOOK MILLS=2540×490 (Table I)=		$1,244,600
ESTIMATED NET ANNUAL LOSS DUE TO INEFFICIENCY 2530×490 (Table I)=		$1,239,700

PIONEERS SINCE 1863 IN THE MANUFACTURE OF PAPER MILL AND WOOD PULP MACHINERY

RESILIENT

LEADERSHIP
Unswerving adherence to standards of quality has kept the names HOLYOKE and HOLYOKE MACHINE COMPANY at the head of the preference list of all good Paper and Wood Pulp manufacturers.

ALL HOLYOKE Cotton and Paper Rolls are *Resilient*,—to just the right degree. The long experience of HOLYOKE Engineers makes it possible to attain *uniform* resiliency. This in turn helps to assure a higher quality paper of whatever grade you are running,—uniform in finish throughout.

Write HOLYOKE MACHINE COMPANY, Holyoke, Mass., Manufacturers of Super Calenders, Platers, Cotton and Paper Rolls, Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors.

The HOLYOKE MACHINE COMPANY

FOUNDED 1863

mills. For pulp mills the range was from $94 for groundwood to $262 for sulphite, and $154 for all. For both paper and pulp mills the net annual saving was $201 per ton of daily capacity. The maximum gross returns for individual mills, both paper and pulp, range from 356 per cent to 2,420 per cent, the minimum from 15 per cent to 108 per cent, and the total for each classification from 71 per cent to 544 per cent. For all mills the gross return was 236 per cent.

Table IV
Summary
Mills Reporting Efficient Utilization

Class	Mills Reporting		Amount Expended		Return on Investment					
	No.	Daily Ton. Cap.	Total	Per Ton	Total	Net	Per Ton Net	Percent Mx.	Mm.	Tot.
Paper Mills										
Book	9	1,046	$ 360,670	$345	$ 603,580	$ 513,412	$490	1570	37	167
Wrapping	17	1,301	210,210	161	307,540	255,018	196	1580	24	146
Paperb'd	9	1,913	105,890	55	106,460	79,988	56	829	15	101
News	6	1,926	157,800	82	329,290	289,840	171	575	49	208
Writing	5	378	48,040	127	251,050	249,040	659	2420	108	544
Unclassified	8	953	136,150	143	278,270	244,232	293	1050	107	204
Strawboard	Insu	fficient	data to make	compu	tations.					
Tissue	4	214	70,600	330	165,700	148,050	690	356	100	234
Totals	58	7,731	$1,089,360	$141	$2,051,890	$1,779,580	$230	2420	15	265
Pulp Mills										
Sulphite	15	1,493	$ 289,610	$194	$ 465,170	$ 392,770	$262	560	37	161
Gr. Wood	17	2,752	280,470	95	323,075	257,958	94	624	31	124
Sulphate	7	420	100,850	240	71,180	46,968	112	409	24	71
Soda	2	170	39,940	234	53,900	43,915	258	570	37	135
Totals	41	4,835	$ 690,870	$143	$ 913,325	$ 741,611	$154	623	24	189
Total, Paper and Pulp Mills										
Totals	99	12,564	$1,780,230	$142	$2,965,315	$2,521,191	$201	2420	15	236

From Table V for inefficient mills it will be observed that the amount expended per ton of daily capacity ranged from $34 for paperboard to $216 for writing, being $106 for all paper mills. For pulp mills the corresponding figures ranged from $41 for groundwood to $196 for sulphite; $151 for all. For both paper and pulp mills the expenditure was $120 per ton of daily capacity as compared with $142 for efficient mills. The net annual return per ton of daily capacity ranged from $29 for paperboard to $508 for writing, in paper mills, with a total of $147, while for pulp mills the range was from $38 for sulphate to $206 for sulphite, with $148 for all. For both paper and pulp mills the total return was $148 as compared with $236 for the efficient mills.

In some few instances the expenditure in the inefficient mills was approximately equivalent to, or slightly in excess of that reported in the efficient mills. This is probably due to the installation of inefficient equipment or certain local conditions. The estimated net annual loss due to inefficiency in the mills reporting range from $37,300 in wrapping to $1,110,000 in strawboard, with a total for paper mills of $2,035,617. The estimated loss for the strawboard mills is based upon a new process recently developed, which it is reported will reduce the cost of production $3 to $4 per ton. Approximately $1 per ton, however, is all that has been allowed in the estimate. The net loss in pulp mills ranged from $21,168 for sulphate to $140,432 for sulphite, with a total of $322,486. The total for both paper and pulp mills reporting was $2,358,103.

Table No. VI presents similar data to that previously discussed for the industry as a whole including estimates for mills not reporting. It will be observed that the annual saving ranged from $271,860 for tissue to $1,244,600 for book, while the net annual loss ranged from $253,568 for paperboard to $1,239,700 for book. In the pulp mills the total saving ranged from $92,512 for sulphate mills to $843,116 for sulphite, with a total of $1,519,068, while the loss ranged from $137,088 for sulphate to $874,556 for sulphite mills, with a total of $1,538,284. Considering the industry as a whole, 46 per cent of the total tonnage replied to the questionnaires, and it is estimated that the efficiency in fiber utilization is 46 per cent. The total saving to the industry at the present time in the utilization of fiber is estimated to be $5,261,615 annually, while the potential loss due to inefficient utilization is estimated to be $6,389,167.

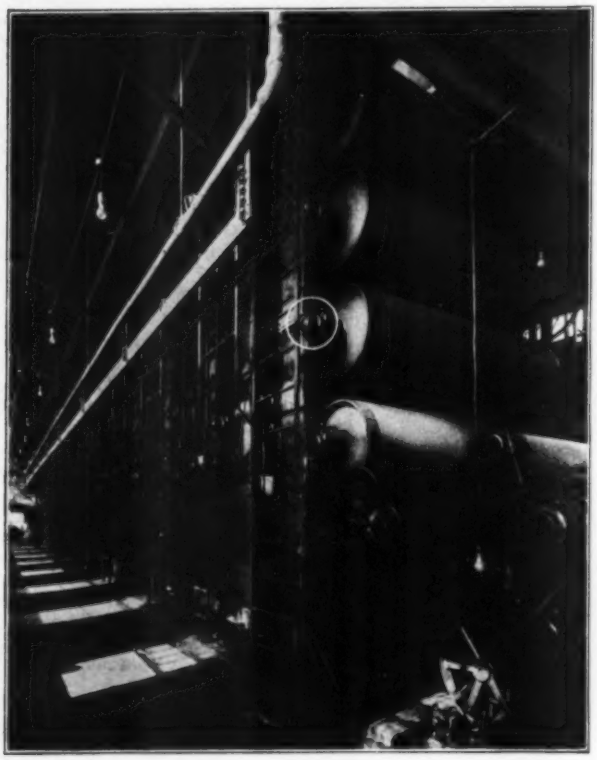
Discussion

While it has been necessary to make certain assumptions and fill in considerable missing data, it is believed that if the results are erroneous they are on the side of conservatism. First, the degree of

Table V
Summary
Mills Reporting Inefficient Utilization

Class	Mills Reporting		Amount Expended		Return on Investment			Net Loss Due to Inefficiency
	No.	Daily Ton. Cap.	Total	Per Ton	Total	Net	Per Ton Net	
Paper Mills								
Book	16	1,750	$ 352,384	$201	$ 531,010	$ 442,914	$253	$ 403,760
Wrapping	10	431	43,930	99	64,050	53,068	123	37,300
Paperb'd	39	3,421	116,555	34	127,128	97,989	29	122,696
News	9	593	49,160	83	102,262	89 972	152	51,471
Writing	16	466	101,191	216	262,770	237,472	508	132,459
Unclassified	17	703	126,760	180	207,880	176,190	251	84,091
Strawboard	Insu	fficient	data to make	compu	tations			1,110,000*
Tissue	9	151	9,600	64	13,392	10,992	73	93,840
Totals	116	7,515	$ 799,580	$106	$1,308,492	$1,108,597	$147	$2,035,617
Pulp Mills								
Sulphite	19	1,327	$ 258,012	$196	$ 338,240	$ 273,740	$206	$ 140,432
Gr. Wood	15	699	28,610	41	45,205	38,053	54	42,206
Sulphate	4	250	20,900	84	14,840	9,615	38	21,168
Soda	12	984	185,403	188	208,002	161,651	164	118,680
Totals	50	3,260	$ 492,925	$151	$ 606,287	$ 482,059	$148	$ 322,486
Total, Paper and Pulp Mills								
Totals	166	10,775	$1,292,505	$120	$1,914,779	$1,590,656	$148	$2,358,103

*Computations based upon new process.



Positive dryer-roll lubrication by Bowser

In the new dryer-roll section of the Ft. Wayne Corrugated Paper Company in Hartford City, Indiana, a Standard Bowser Lubrication system is oiling the stack of five vertical rolls.

This *positively* feeds *all* rolls *all* the time. It's fully automatic.

The oil is pumped from the storage tank to a gravity tank above the rolls, and then by gravity is fed to sight feed oilers which feed the top rolls. The oil then cascades down to each lower roll. Under the bearing of the bottom roll there is a flow sight to prove that all bearings are *being* lubricated.

Our standard "A" filter cleans the oil after it has done its work, returning it to the gravity tank.

It's a thoroughly simple system, positive in action, and easy on the oil supply, taking a very small amount of makeup oil.

We would like to demonstrate to you the advantages of our lubricating systems, and show you that with Bowser the job is done better and more economically.

S. F. BOWSER & COMPANY, INC.

Complete Lubrication Equipment

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FORT WAYNE, INDIANA

Table VI

Summary

Estimated Totals for all Mills

Class	Daily Tonnage Capacity			Efficient Tonnage Equiv.		Net Annual	
	Total	Mills Reporting Total	%	Total	%	Saving	Loss
Paper Mills							
Book	5,070	2,796	55	2,540	50	$1,244,600	$1,239,700
Wrapping	4,930	1,732	35	2,442	50	478,632	507,248
Paper b'd	8,450	5,334	63	3,922	46	219,632	253,568
News	4,790	2,519	53	2,786	58	448,546	322,644
Writing	1,605	844	53	833	52	548,947	507,758
Unclassified	3,425	1,656	48	1,810	53	530,330	473,195
Strawboard	3,700	Insufficient	data to	make comp	utations		1,110,000*
Tissue	1,027	365	36	394	38	271,860	436,770
Totals	32,997	15,246	46	14,727	45	$3,742,547	$4,850,883
Pulp Mills							
Sulphite	6,556	2,820	43	3,218	49	$ 843,116	$ 874,556
Gr. Wood	7,620	3,451	45	4,044	53	380,136	335,204
Sulphate	2,050	670	33	826	40	92,512	137,088
Soda	1,530	1,154	75	788	51	203,304	191,436
Totals	17,756	8,095	46	8,876	49	$1,519,068	$1,538,284
Total, Paper and Pulp Mills							
Totals	50,753	23,341	46	23,606	46	$5,261,615	$6,389,167

*Computations based upon new process.

efficiency has not been considered 100 per cent, or even what will be probably, ultimately a practical attainment, but rather an efficiency on which the more progressive mills are now actually operating in the different grades. Second, the prices used in estimating the value of the recovered material were low. Third, liberal allowances have been made in all cases.

Regardless of the factor fiber wastes may be in stream pollution, it seems essential that the industry proceed without delay to utilize this great economic loss. Directly or indirectly, however, fiber wastes do result in objectionable stream pollution. The accumulation of fiber on the beds of streams interferes with the spawn and spawning of fish. Furthermore, it frequently causes unsightly conditions. It is the visible evidence of pollution which will more quickly attract attention and adverse criticism than almost any other type. There is no question but that this source of stream pollution can be eliminated to the financial advantage of the industry.

Research will be necessary in order to realize the best results, particularly in certain grades of papers, and where frequent changes in color are made. A type of save-all or equipment applicable to one mill may not be suited to the conditions of another. Therefore, careful investigation should be made by each individual mill before installing equipment in order that the best results may be secured with a minimum expenditure. Recirculation of the effluent from save-alls to the showers and other parts of the system is sound and logical practice. It is believed that, at least in some branches of the industry, methods will be developed whereby the white water will be recirculated through the system without passing through the save-alls. In other words, there will be developed closed systems whereby the white water will be used on the showers without removal of the fiber, and the fiber will be carried directly back into the sheet with no loss to the sewers. In fact, this is substantially the new method developed in the strawboard industry.

The ultimate goal which should be the aim of every paper and pulp mill is undoubtedly a closed system, whereby all the fiber is utilized, and no effluent white water enters the stream. This is not an idealistic goal, but is practical and, in some few mills, is now almost, if not quite, attained. Troubles that have been experienced in the past in the control of slime, later experience indicates can be overcome either by sterilization with chlorine or by coagulation, or a combination of the two methods.

Conclusions

In conclusion there can be no question but that there is now a tremendous economic loss in the pulp and paper industry, due to inefficient fiber utilization. These wastes constitute a serious factor in stream pollution. Their utilization to the fullest extent will correct this objectionable condition, and result in material financial saving to the industry. Research will be necessary in certain branches of the industry to secure the best and most economical results. Care should be exercised in the selection and installation of equipment in order to be sure that it is adaptable to the conditions of the particular mill, and that the best results may be secured with a minimum expenditure. A careful earnest scientific study of the problem and application of the results to its solution, however, will result in a substantial financial return to the industry and elimination of fiber wastes as an objectionable factor in stream pollution.

First Safety Conference for State of Maine

Maine's first annual safety conference will be held in the House of Representatives, State House, Augusta, Maine, on Thursday, November 15, 1928. This one-day conference sponsored by such organizations as the National Safety Council, Maine Deparment of Labor, Maine Automobile Ass'n, Maine Associated Industries and others is for the purpose of reaching those who control the destiny of the Safety movement.

Because of time and expense, it is believed that many safety men in and about the State of Maine were unable to attend the Seventeenth Annual Congress which ended October 5, 1928 in New York City. Therefore, a miniature congress was planned and will be brought to their very door-step on November 15th. Many speakers who have achieved success in accident prevention work have agreed to participate. Among these is L. J. Parant, manager, St. Croix Paper Co., Woodland, Maine, who will act as chairman of both morning and afternoon sessions. Hon. R. O. Brewster, Governor of the State of Maine, will officially open the conference with an address of welcome.

Other speakers and their subjects are: "Management's Responsibility", C. O. Beals, Commissioner of Labor, Augusta, Maine; "Employees' Responsibility'', Judge B. F. Cleaves, secretary, Maine Associated Industries, Portland, Maine; "Safety a Community Problem", L. E. MacBrayne, general manager, Massachusetts Safety Council, Boston, Mass.; "What's it All About", G. E. Burns, safety engineer, National Safety Council, Chicago; "Fundamentals of Accident Prevention", John Lundrigan, industrial superintendent, International Paper Co., New York City. General round table discussion will be led by N. F. Bartlett, Hollingsworth & Vose Co., Boston, Mass.

Complete programs are now being printed. For further information, address Commissioner C. O. Beals, Department of Labor, Augusta, Maine.

The Newark Paraffin and Parchment Paper Co. recently awarded a general contract for extensions and improvements to its plant at Waverly and Jelliff Avenues in Newark, N. J., which it is estimated will cost in excess of $21,000.

EXPERIENCE

Knowledge gained from over 50 years of making Wires for American and Foreign paper makers has led to the development of looms of our own design; wire drawn to specification in our own plant; skilled, experienced operators, and a product giving long and dependable service.

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Penn.-New Jersey Supers Meet

Mill Visits and Discussions of Steam Turbines, Rod Mills and Decreasing Hours of Work

A WELL attended meeting of the Pennsylvania-New Jersey division of the American Pulp and Paper Mill Superintendents Association was held at York and Spring Grove, Pa., on Friday and Saturday, September 21 to 22. Members and visitors began to arrive at headquarters in the Hotel Yorktowne, York, on Friday afternoon for registration and a business meeting of officers and committees. The registration desk was in charge of Mrs. J. H. Dow, who was assisted by Robert L. Eminger, national secretary. Fifty-three members and guests signed the roll on Friday evening and by Saturday morning at 9 o'clock the attendance had swelled to nearly 100.

Election of Officers

New officers were elected at a business meeting on the first day, J. E. Blosser, of the Scott Paper Company, Chester, Pa., being chosen chairman. S. Carrol Wentz, superintendant of the paper plant of the P. H. Glatfelter Company, Spring Grove, Pa., was elected as vice chairman. Charles L. Ellis, of the Downingtown Manufacturing Company, Downingtown, Pa., was chosen secretary to succeed John A. Bower, and J. B. White, of the National Vulcanized Fibre Company, Wilmington, Del., was named treasurer in succession to Ward M. Smith.

Inspection of Glatfelter Mill

The program for Saturday began with an automobile trip to the mills of the P. H. Glatfelter Company at Spring Grove, and an early start was made, all motor cars leaving promptly at 9 o'clock. At the mill the visitors were met by P. H. Glatfelter, vice president, and W. S. McClellan, general manager, who assigned guides to conduct the party through the different departments of the plant. Each member of the party in passing through the office of the company was handed an attractively illustrated publication consisting of a twenty-page booklet, measuring 9 x 20 inches, replete with half-tone reproductions of motion picture films depicting every detail and process as well as the machinery employed in paper manufacture, the strips numbering 183 separate pictures, ranging from views of woodlands and woodyards, and cooking processes for both wood and old paper, through the various departments of the mill from boiler to finishing room. An historical account of the development of papermaking operations at Spring Grove introduced the text pages, containing popular accounts of the equipment and operation as well as the technique of preparing pulp for conversion into paper.

Luncheon on the Lawn

Following the trip through the Glatfelter mill, the visitors were taken in motor cars to the Glatfelter country home, "The Hill", a beautiful example of Tudor architecture, situated about half a mile distant, where they were the guests of W. L. Glatfelter, president, and P. H. Glatfelter, secretary and treasurer of the P. H. Glatfelter Company, at a luncheon served on the lawn. Before luncheon was served the visiting members and guests were arranged in a semicircle fronting a lily pond stocked with gold fish, where a panoramic photograph was taken of the party.

Business Meeting at Spring Grove

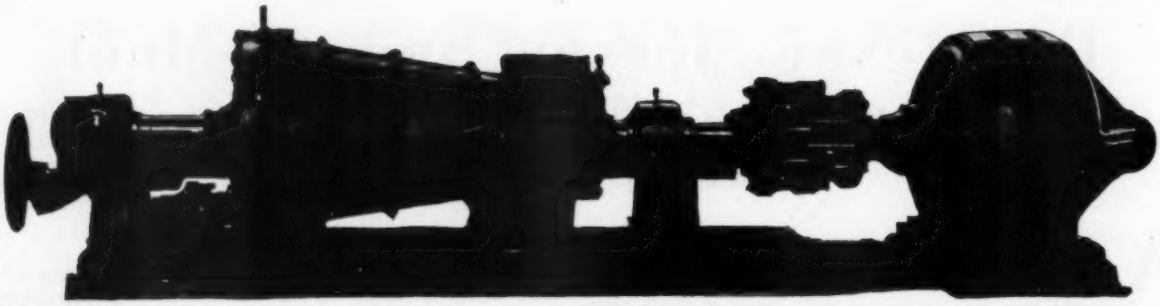
It was originally planned to have a general business meeting at Hotel Yorktowne, immediately preceding the banquet hour for the purpose of hearing a paper read describing the merits of the Terry turbine for paper machine drivers, but as it was felt that a better attendance would be secured by holding the meeting in Spring Grove, it was arranged that V. L. Sanderson, district manager of the Philadelphia office of The Terry Steam Turbine Company, should present his paper at 1 o'clock in the auditorium of Glatfelter Hall, adjoining the mill property. Upwards of seventy members and visitors gathered in the hall to hear Mr. Sanderson, who was introduced by Chairman Ellis.

Terry Turbine for Machine Drives

By means of a small protable projector, Mr. Sanderson threw pictures of turbines and their parts on a screen giving a thoroughly entertaining as well as educational account of the development of the Terry steam turbine from the initial experiments of E. C. Terry at Hartford, Conn., in 1888 down to the present time. Mr. Terry was a pioneer in the manufacture of a type of turbine that could be direct connected to either pump, fan or generator without the use of gears. He took out his first patent in 1892, but it was not until 1902 that the machines were placed on the market. By 1903, he was building one turbine a month, and in 1907 he sold eight 300 h.p. turbines to the New York Edison Company, the first important installation of its kind, which went far to establish the commercial success of the Terry turbine. After twenty-one years of service, said Mr. Sanderson, the turbines then ordered by the New York Edison Company and put to use, are still being operated in the driving of centrifugal boiler feed pumps.

A year later, 1908, our Navy Department made a purchase

Panoramic picture of Pennsylvania-New Jersey meeting of Superintendents Association at Mr. Glatfelter's home, Spring Grove, Pa., September 22, 1928



THE No. 2 EMERSON JORDAN

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TIMKEN ROLLER BEARINGS

A New Epoch in the paper making industry

The No. 2 Emerson Jordan, shown above, is a masterpiece of refining equipment, having Timken Roller Bearings and Bandless Plug. This sturdy, well constructed bearing application is just another characteristic of Emerson Quality and progressive engineering.

Features to Consider.

(1) Timken Roller Bearings, both radial and thrust, are mounted on taper-bored sleeves.

(2) Bearings are enclosed in sealed housings that prevent the bearing troubles generally experienced when bearings are mounted directly on the shaft.

(3) Bearings are NOT mounted directly on the shaft.

THE EMERSON MANUFACTURING CO. Lawrence, Mass.

of Terry turbines for use in operating forced draft fans on torpedo boat destroyers, this being the first marine installation of turbines in the U. S. Navy. The application proved highly successful and many hundreds have since been used on shipboard. The airplane carriers "Lexington" and "Saratoga" each have 42 Terry turbines on them and the new scout cruisers now under construction will each have approximately the same number, Mr. Sanderson said.

As applied to paper mill work, the Terry turbine is of comparatively recent introduction. It was first used on a paper machine drive twelve years ago, in 1916, just fourteen years after the turbine had been put on the market. Paper machine drive is a much more exacting service than pump, fan, or generator requirements. Mr. Sanderson described the types of turbines applied to paper machine drives and showed screen views of installation in use at various paper mill plants, including the St. Maurice Paper Company's mill at Three Rivers, P. Q., and the St. Regis Paper Company, Carthage, N. Y.

The first variable-speed drive was installed at the Fox River Paper Company, Appleton, Wis., in 1920. Existing transmission practice of using cone pulleys for obtaining variable speed was followed, but experience led to the adoption of a more compact method and the Terry-Reeves design was introduced. Pictures were flashed on the screen of installations at the St. Helens Pulp and Paper Company, St. Helens, Ore., Albemarle Paper Company, Richmond, Va., and other mills.

It developed that remote control of variable speed drives would be desirable, and this was easily adaptable to the Terry-Reeves variable speed controller by using an electric motor instead of a handwheel, a unit of this kind having been built for the Southern International Paper Company, Bastrop, La. Other improvements in speed control were developed, one being a fluid type, built into the turbine. A unit of this kind was shown on the screen. It was designed for the Camden, Ark., mill of the International Paper Company. It was arranged for remote control, the governor being operated by a small motor mounted on the oil tank below the governor, as shown at one end of the picture. It is governed by push buttons, one for East and one for Slow. A button is pushed and when the needle on the indicator reaches the desired speed, the button is released and the speed stays there.

In the newer types of remote control regulation turbines, the push buttons are eliminated, a small adjustable screw being used directly on the gauge. The gauge is set at the desired speed and the turbine automatically adjusts itself to this speed.

In addition to pictures of driving units, charts of speed were projected to show the steady character of the drive. In closing, Mr. Sanderson enumerated the various paper machines to which the Terry drive has been applied, mentioning Beloits (15), Rice, Barton & Fales (6), Pusey & Jones (6), Bagley & Sewall (3), Black-Clawson (3), J. Horne & Sons (2), Smith & Winchester (2), Shartle Bros. (1), Downington (1), H. C. Clark & Sons (1), besides some 13 or 14 unidentified machines.

Discussion of the paper was invited by Chairman Ellis and the great interest taken in the subject was shown by a fire of questions and comments by the superintendents present.

A Talk on Rod Mills

Following the paper by Mr. Sanderson, an account was given by William A. Gocke of the operation of the Hardinge Conical Rod Mill, as manufactured and patented by the Hardinge Company, York, Pa., and sold by Shartle Brothers Machine Company division of the Black-Clawson Company, Middletown, Ohio. The rod mill was to have been demonstrated at the Hardinge plant in York, but a machine was not available, so Mr. Cocke decided to make his talk at Spring Grove. He had no set paper but discussed the general application of the rod mill as a substitute for beating egines in the treatment of certain fibres, especially where any pronounced degree of hydration was required. He expressed his belief that all kraft mills would ultimately adopt rod mills for the treatment of semi-chemical pulps, and said that ten rod mills were already in use on kraft pulps alone by six firms of paper manufacturers. The size of these mills ranged from 4 x 8 ft. inside dimensions, to 7 x 16 ft.

Mr. Gocke made reference to a recent survey of the Forest Products Laboratory at Madison which showed that thirty-seven rod mills were now in use throughout the country. Four companies reported five mills running on sulphite pulp or screenings, five other companies employing thirteen rod mills in the production of semi-chemical pulps, while one company was using three rod mills on straw and chip boards.

What Hydration Means—Mr. Gocke undertook to give an explanation of the term "hydration" as used in beating operations. He said there were three kinds of water involved in the beating operation: (1) water of suspension; (2) water taking the place of air in the fibres, and (3) water of adsorption, the last named being a form of physical combination that gave the stock its slow, smeary quality.

Function of the Rod Mill—There was a long and interesting discussion of the operation of the rod mill and Mr. Gocke answered a stream of questions that poured in on him. He said that the rod mill was capable of pulping 1,800 lb. of stock per hour, and that at the mill of the Bayless Manufacturing Corporation, Austin, Pa., one was operated commercially in the manufacture of a semi-parchment sheet from Mitscherlich fibre. In operation a rod mill used 90 h.p. Asked what piece of apparatus in a mill was displaced by the rod mill, Mr. Gocke said the beater, but he did not know of any mill that was not using beaters as well as rod mills, the latter being used as auxiliary equipment to help out the beater. The rod mill was particularly serviceable in pulping straw, as it brushed out knots and other hard parts to make a sheet equal to manila.

Mill Visits

After passing votes of thanks to Mr. Sanderson and Mr. Gocke, the meeting was adjourned. Groups were then formed for visits to mills and manufacturing plants in the vicinity of York. A large number of the visiting superintendents were taken in automobiles to inspect the plant of the York Haven Paper Company, while others visited the Schmidt & Ault and Penn Fibreboard mills in York. Some members of the party made the interesting trip to the field of the Battle of Gettysburg, distant twenty miles from Spring Grove.

Banquet at The Yorktowne

The meeting closed with a banquet in the ballroom of the Hotel Yorktowne at which covers were laid for 102. Retiring Chairman Ellis presided and before introducing the speakers expressed the gratitude of the Pennsylvania-New Jersey Division for the generous aid given by local manufacturers toward making the meeting the success it had proved to be. He remarked appreciatively that there were few paper mill centers that could boast of such great scenic beauty as York and its vicinity.

Historical Associations of York

Mayor Jacob E. Weaver of York, was introduced and gave the visitors a most cordial welcome to the city. He narrated some interesting historical particulars of the foundation of York, which dated from 1741. Referring to York in the Revolutionary period, he said that when the British occupied Philadelphia, York became the national capital and the Continental Congress remained in session there from September 30, 1777, to June 27, 1778.

Mayor Weaver also gave an account of the industrial position of the city which ranks third in diversified industries in the State of Pennsylvania, and spoke of its low death rate, which prompted James E. Ramsey to make a joke when he was called upon for a response to the Mayor's welcoming address.

Mr. Ramsey said he had heard of the general salubrity of the locality, but was not aware that the death rate was lower than any other community of the same size in the State of Pennsylvania. It this were true, it could only be attributed to the absence of bootleggers, a sally which brought a humerous but guarded disclaimer from the Mayor.

When Lincoln came to . . . Cincinnati

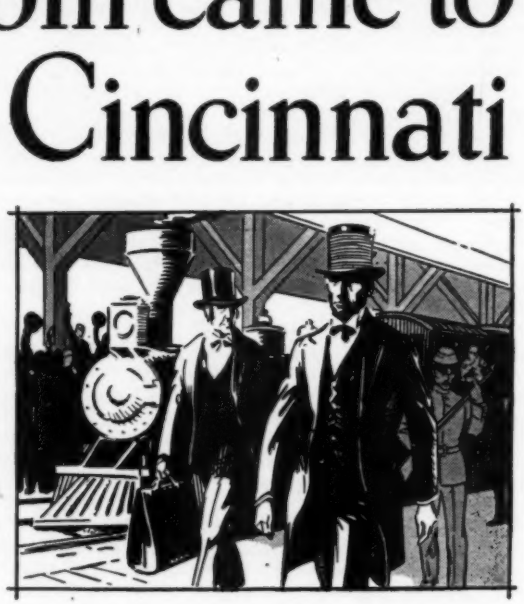
JUST about the time that Asa Shuler and J. W. Benninghofen formed a partnership for the manufacture of a better kind of paper making felt, Abraham Lincoln came to Cincinnati to give a talk.

No doubt the two young men up in Hamilton, Ohio, would have liked to come down to hear him. But twenty miles in those days was a long way.

It meant sacrificing almost two days to their rapidly growing business, which was still too young to afford this inattention.

The descendants of these two men are making still better felts. For they have in back of them all this accumulated experience gained in more than 70 years of felt manufacturing. They have learned what to do as well as what not to do.

And the result is a felt that takes out



water in more than unusual quantities; that wears long with less down time for washing; that helps to produce a better finished piece of paper—in a word, a felt that saves money and makes money for you.

Try a Hamilton Felt on your hardest machine. Give it every test of inspection and service you think a felt ought to have. You will want to use Hamilton Felts on all your machines.

Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

Ask the Hamilton Felt man the next time he calls, or write us direct—he is a practical paper maker as well as a felt expert.

Shuler & Benninghofen, Hamilton, Ohio

The Miami Woolen Mills

ESTABLISHED 1858

Hamilton Felts

Industrial Problems

The principal speaker of the evening was the Hon. Henry C. Niles, judge of York County courts, who was to address the diners, according to the program, on "Fundamental Industrial Problems", but who asked to be excused from discussing anything of so serious a nature before such a gathering of "brave men and charming women" as confronted him. Instead he would give an account of certain legal problems, which he did in high entertaining fashion, touching on the position of the papermaker in the world's history. He spoke of the displacement of man power by machine power and said that a great social problem was likely to arise in the future when everybody would have more leisure owning to a decrease in the hours of work to three days a week, and by and by to less than eight hours a day, perhaps to four hours a day. The question was what would the workmen do with this leisure time. How would they employ themselves?

Judge Niles told his audience that they represented a most ancient and honorable craft, for the men who made paper were the ones who preserved the records and traditions of a people and its government. The original inventor of paper was unknown, but who knew when Cadmus the mythical inventor of letters lived? Judge Niles left the question unanswered, but remarked that the invention of letters, like that of paper, was at the foundation of all civilization and culture.

The speechmaker was brought to a close with an address by the newly elected chairman, J. E. Blosser, who thanked the retiring officers for the work they had done during the year. Mr. Blosser said it was the intention to have more frequent business meetings to which members only would be admitted, but that general meetings like the present one, open to all interested, would also be held.

Roster of Attendance

The attendance at the meeting was large and even exceeded the expectations of the committee who found it necessary to provide increased accommodations for the influx of visitors. For a comparatively new division an attendance of 102 including visitors was a little remarkable. The actual membership of the division is in the neighborhood of sixty and there was a 50 per cent representation, those making up the bulk of the registration consisting of prospective members connected with local mills, mill supply and equipment men and other visitors including ladies.

Expert Advice in Clay Problems

As a new departure in the way of service Edgar Brothers Company, producers of domestic high grade filler and coating clays, 50 Church Street, New York, announce that they have engaged the services of O. W. Callighan, who has been chief chemist of the Allied Paper Mills, Kalamazoo, Mich., and has had a great deal to do with the application of American clays in papermaking.

Mr. Callighan was graduated from the University of Maine, having taken the paper course there. He has had practical experience in paper mill work, and, Edgar Brothers say, is capable of going into a paper mill and helping to solve any problems that may be encountered in the use of American clay, particularly where the mill has been using the English product.

George E. Hall

George E. Hall, for the past 12 years president and general manager of the Boston Woven Hose & Rubber Co., Boston, Mass., died suddenly at Osterville, Mass. on Cape Cod October 3, 1928.

Mr. Hall was born in Brattleboro, Vt., August 2, 1868. He was formerly connected with the International Paper Co. of Watertown, N. Y., and joined the organization of the Boston Woven Hose & Rubber Co. in 1907, being elected president in 1916.

Mr. Hall continued actively in business almost to the very day of his death. He was apparently in normal health and left the office only a day or two before his death for a few days' rest and recreation.

NORTHERN NEW YORK NEWS

Forestry Notes

A reforestation plan which has been the subject of discussion for the past four years by the board of supervisors of Washington County, has been abandoned. This decision was reached after a resume of reports which were received from different points in the county showed very little waste land available for this purpose. The largest available amount of land was found to be at Dresden, N. Y., which reported 5,000 acres.

The annual forestry tour for Lewis County, which was conducted under the auspices of the Lewis County Forestry Council, was held October 5, and was led by Prof. J. A. Cope of the Forestry Department, Cornell University. The party met at the State Forestry Nursery at Lowville, N. Y., and proceeded on a tour of several of the large forest preserves. There were also a number of interesting addresses on forestry.

Three hundred acres of a heavy stand of virgin timber in Herkimer County, will be cut this winter by the owners, Northern New York Utilities, Inc., of Watertown, to make way for flow of ground for a large power dam which is under construction in that section.

New Patents

The patent covering an improved type of paper bag having a prepared tubular blank, has been assigned by the inventor, Joseph W. Taggart, to the Taggart Brothers Co. of Watertown, of which he is vice president.

John D. Haskell of Fulton, was recently granted a patent on a device to be applied to a machine for beating paper, which patent has been assigned to the Dilts Machine Works of Fulton.

Sealright Co.'s New Building Nearing Completion

The addition to the plant of the Sealright Co., Inc., of Fulton, a subsidiary of the Oswego Falls Corp., will soon be completed. The new building is 113 ft. long and 100 ft. wide, and will increase the company's production 33 per cent. New machinery is to be installed and the machinery in the entire plant will be rearranged.

This company manufactures Sealright paper containers for ice cream, also paper milk bottles and caps.

Oswego to Have Hydro-Electric Chemical Plant

Floyd L. Carlisle of the Carlisle interests in Wall Street, New York City, announced at a recent meeting in Oswego, N. Y. that plans are being made for the building of a hydro-electric chemical plant in Oswego. The plant will be another addition to the Carlisle interests in Oswego and Northern New York, and if present plans are carried out, work on the new plant will be started in the near future. The plant will manufacture chemicals such as are used in bleaching, water purification and paper manufacturing.

The plant will be located in the eastern part of the city where the plants of the Taggart Oswego paper and Bag Corp. and the Oswego Board Corp. are located.

Supreme Justice Rules Against Sweet Bros.

The water power rights of manufacture near Phoenix, N. Y. have been decided by Supreme Court Justice Nathaniel A. Foote of Rochester after a nine year litigation. The decision was in the case brought by John Dunlop Sons, Inc. and the Senoso Paper Co. against the Sweet Brothers paper Mfg. Co. of Phoenix.

One of the most important points in the decision of former Justice Foote is that the rights of the State of New York are confined to the water needed actually for canal purposes, thereby rejecting the Sweet Company claim that the State and not its adversaries owned the power in dispute.

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beating speeds profitable production

Uniformity in the beaten stock supplied to your machines means less time charged off to "broke".

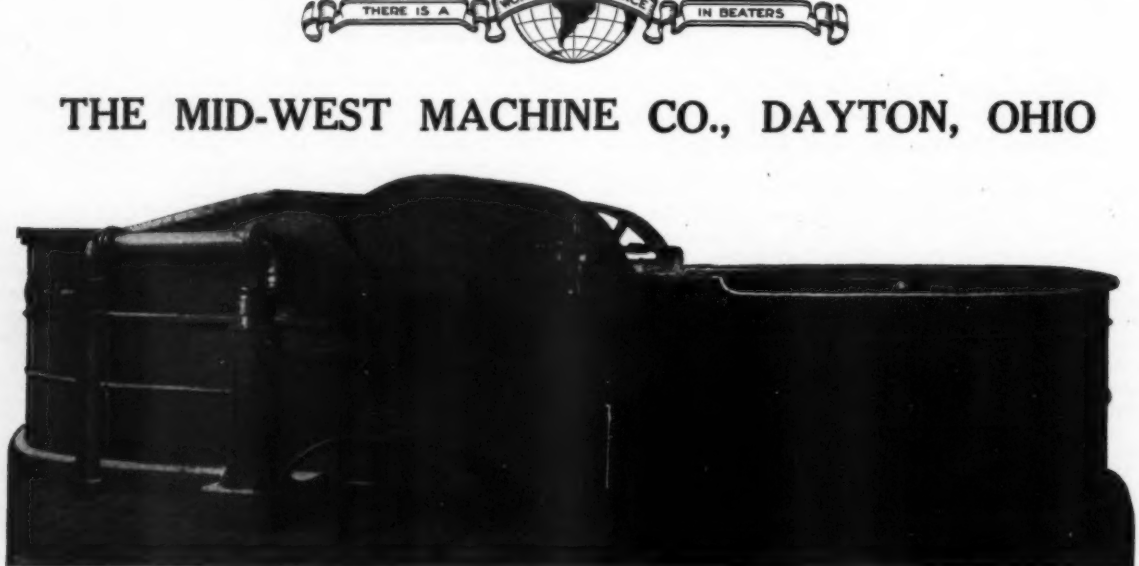
In addition to larger production, there is a distinct gain in quality that tells in customer satisfaction.

Uniform beating is an outstanding characteristic of the Mid-West Hi-Speed Beater. There are no dead spots in a Mid-West. Positive circulation feeds the stock uniformly to the beater roll. Rapid circulation gives more frequent beating. The result is a sheet that comes from the machine steadily and uniformly good.

There are other facts about Mid-West Beaters that deserve your consideration. Write for them today.

THERE IS A WORLD OF DIFFERENCE IN BEATERS

THE MID-WEST MACHINE CO., DAYTON, OHIO



MID-WEST
PAPER MILL MACHINERY

The Month at Washington

A PAPER manufacturing process known as the "Delthirna" process is being watched with considerable interest in England, according to Trade Commissioner Martin H. Kennedy, London. It is reported that at least eight large mills are quietly experimenting with the process. Briefly, the "Depthirna" process is a method of sizing, by which the pulp in the beating engine is treated with a solution obtained by passing a cold solution of caustic soda over broken rosin. The pulp so created is then subjected to a still further operation in the beating engine and then treated with alum. It is said that the process yields a strong hard paper that is practically nonabsorbent. Further data may be had from the Chemical Division of the Bureau of Foreign & Domestic Commerce.

New Commerce District Offices—Five new district offices were opened up by the Department of Commerce recently, at Charlotte, N. C., Denver, Colo., Indianapolis, Ind., Milwaukee, Wis., and Pittsburgh, Pa., bringing the total up to 28. There is an office near you. Write the Department if you are not now using this service.

In 1921 there were but 7 offices functioning, while last year 23 offices rendered 2,500,000 separate services as against 340,000 services performed in 1921. The dollars-and-cents value to business resulting from the activities of the various District Offices was $15,000,000, according to information volunteered by some of the business men who benefited by the various services rendered. Besides their services in connection with export trade, each office will serve as a clearing house for firms in its district for information on many problems connected with domestic marketing, and the best marketing practices. They also co-operate in arranging for special investigations designed to meet particular needs in the areas served.

A Directory of Laboratories—"Directory of Commercial Testing and College Research Laboratories", is the title of Bureau of Standards Miscellaneous Publication No. 90, just issued, furnishing an exhaustive list of laboratories throughout the country prepared to test various kinds of commodities to determine whether or not they comply with purchase specifications, and for commercial testing service in both domestic and export trade. Because of the large amount of government work, the Bureau of Standards cannot make tests for private individuals if other laboratories can do the work, and so 271 commercial testing laboratories are listed and 186 college research laboratories, showing what types of commodities each laboratory is prepared to test.

New Wireless Service—The Radio Corporation of America proposes to the Federal Radio Commission the establishment of a wireless service for business centers, announcing a plan to link more than 30 cities in their new system, also predicting a reduction of ocean rates. The Commission is asked to allocate 148 channels in short wave band to the company.

Australia Encourages Paper Manufacture—The Australian government is now encouraging the manufacture of paper from native timber. Wood pulp made from the Australian pinus insignis by the sulphate (or kraft) process is suitable for papermaking and is practically equal in quality to the pulp now imported into Australia for that purpose, according to recent experiments conducted in conjunction with Australian Paper Manufacturers, Ltd., at the request of the South Australian Government. In the course of experiments 80 tons of green timber were used.

Instruction at Bureau of Standards—The Educational Committee of the Bureau of Standards is giving 10 courses in scientific and technical subjects, open to firms who desire to send any of their men to the Bureau for the course, each course being given by an expert in a particular field. The fees charged are very reasonable. Authority for the work is contained in a joint resolution of Congress back in 1892, opening the Government's bureaus for research and educational purposes.

The Air News—Business today is interested in air transportation and the "Domestic Air News" published monthly by the Aeronautics Branch of the Department of Commerce is available to all firms applying to get on their mailing list. Copies have been multigraphed and distributed, but the question now agitating the Department is whether on on account of its growth in circulation the Air News should not be printed and a charge made of 50c a year. Printing will permit a more convenient size, greater legibility, use of illustrations and tabulations not now possible, as well as increase the volume of material.

Credit Survey—Questionnaires are now being mailed to over 500,000 merchants throughout the country by the Department of Commerce, which has actively begun its survey of the credit situation among retailers. The answers will enable the Department to chart and define the retail credit structure of the United States. Data is being gathered on cash transactions, open credit, and deferred or installment payments, monthly balance collections, bad debts and the detailed administration of credits.

Fire Prevention Week—The annual fire prevention week beginning Oct. 7th prompts the U. S. Chamber of Commerce to issue a statement showing that business bears about 65 per cent of the total fire waste of the nation, and urging that this waste be reduced. Total fire losses in the United States last year decreased from $560,000,000 in 1926 to $478,000,00 in 1927.

Recent Customs Decisions—The Secretary of the Treasury has just issued an index to Treasury Decisions, Vol. 53, Jan.-June, 1928, which is a valuable reference work on customs and other decisions concerning paper, etc.

The Treasury Department has appealed the decision of the U. S. Customs Court (T.D.42867) holding certain paper free of duty as standard newsprint paper under par. 1672 of the tariff act of 1922 (T.D.42925).

Jute shoddy, chiefly used for papermaking, has been found to be adaptable for other uses, and the classification has been changed by the Bureau of Customs to "waste" not specially provided for and dutiable under the Tariff Act of 1922 at 10 per cent ad valorem.

Endless woolen blankets or felt, used on papermaking machines, were held dutiable by the U. S. Customs Court at 30 per cent ad valorem under par. 372, rather than at 50 per cent under par. 1119 (No. 214915-G-29696-26).

Use of Clean Rags—The U. S. Public Health Service advises against the use of dirty rags that may be infected, and advocates the use of clean rags by industries as a sanitary measure, pointing out the chances for spread of disease in unlaundered products. Wiping rags used in industry are often subject to serious contamination. Only laundered and sterlized rags should be used. It is also claimed to be good economy to buy clean rags. Soiled rags sell for 9c a pound and washed rags for 13c a pound. The dirty rags, however, average 15 pounds of dirt to every 100 pounds of rags, while clean rags will absorb a far greater amount of oil, moisture and dirt.

Regulating Industrial Profits—Senator Brookhart proposes to regulate the profits which industries, protected by the government, shall take from the people, in the coming sessions of Congress. He claims that when the Federal Government extends protection to an industry it has the fundamental

What Continuous Causticizing Means to Soda and Sulphate Mills

1. Uniform liquor.
2. Less floor space
   (one-third saving over batch method.)
3. Minimum labor.
4. Reduction in alkali loss.
5. Lower steam consumption
   (75% saving over batch system.)

The Swenson-Mount line of Continuous Causticizing and lime recovery equipment is saving the pulp mills thousands of dollars each year. Our long experience in the design and operation of such equipment is at the service of anyone interested in lower manufacturing costs. Let us help you stop the losses.

Send for descriptive bulletins.

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right to regulate that industry's profits and that the time has now arrived when that idea can no longer be ignored and when corporations and all proctected industries engaged in interstate and foreign commerce shall be prevented from becoming an oppressive or extortionate monopoly upon the people. He intends to introduce such a bill as soon as Congress reconvenes.

More About Aeroplanes—Safer and cheaper aeroplanes is the objective of the National Advisory Committee for Aeronautics, engaged in continuing research in all branches of aero-dynamics. A plane is no better than its wings and an oil burning engine to reduce the hazards of gasoline are among the projects for solution.

The International Civil Aeronautics Conference will be held in Washington on Dec. 12-14.

Change in Consolidated Tax Returns—The Treasury Department is seeking to change the tax regulations affecting consolidated returns, and to change the basis for calculating gain or loss in the sale of a corporation in an affiliated group.

Business Is Good—The Secretary of the Treasury reported to the President regarding the business situation, which he claims very satisfactory as a whole. He sees no factors on the business horizon that warrant pessimism in the next six months. Business throughout the country is regarded by Mr. Mellon as being on a fundamentally sound basis. He believes, generally speaking, that there is an entirely satisfactory productive and distributive condition and that this balance seems likely to be maintained in the near future. As regards the published statements that business usually slumps in a national election year, Mr. Mellon believes this view is fallacious.

Consumers' Club on Purchasing—A club has been formed to make available to the consumer such information as is now available only to the Federal or state government, to municipal agencies and to large firms which make their purchases under precise quality or performance specifications. The club has distributed among its members lists of articles, named by brand and recommended as representing good value at their price, in the opinion of certain testing agencies and technical experts. Other commodities are listed by name, together with the reason why recommendation has been withheld, such as too costly, quality considered; less suitable than competing commodities, misleading advertising, or because the manufacturer has failed to give good service in replacing or repairing defective goods.

Co-operative Plan for Export Sales—Group marketing in noncompetitive lines is the latest project recommended by the Department of Commerce, and the plan does not contemplate pools or mergers, but a co-operative plan of distribution in foreign trade fields at minimum expense to the co-operators. According to the plan, a number of manufacturing groups—noncompetitive—would get together and employ one traveling representative in a certain foreign territory, who would in turn appoint local agents to do the actual selling. Each manufacturer would do his own bookkeeping of sales and maintain contact with the agent, and contribute his pro rata share to the expense. Noncompetitive but co-ordinated lines would best function under this plan. The group plan would also redound to the advantage and profit of the manufacturer entering into the compact. It would give the exporter a thorough grasp on his market and assure him efficient distribution and maximum sales. All accounts with buyers or local agents would be handled separately by the respective companies. It is not necessary to organize under the Webb-Pomerene Act for this purpose, or to take any legal steps except the formal agreement between members of the group.

Price Fixing Urged—Senator Capper says that as soon as Congress reassembles in December he will ask the Senate Committee to hold hearings on his bill (S. 1418) to permit producers to make contracts with retailers and wholesalers to govern the resale price of commodities. The Kelly Bill (H.R.11) in the House has been the subject of hearings by a Committee, but the bill has not yet been reported out of the Committee Room to the House for action.

Pulp Value of Wood Chips—Medium-grade pulps, suitable for the production of the cheaper grades of kraft or wrapping papers, may be made from extracted wood chips which are the by-products of the rosin industry, according to experiments conducted by the Forest Products Laboratory of the Department of Agriculture, but such pulps are unfit for the production of strong first-quality papers.

Recent Government Publications—Commercial Forms (invoice, inquiry and purchase order), Simplfied Practice Recommendation R37-28, has just been issued by the Bureau of Standards.

Internal Revenue Bulletin, Digest No. 22, Jan. 1925-Dec. 1927, has just been issued by the Bureau of Internal Revenue.

Summary of Accident Investigation Reports X, No. 36, has just been issued by the Bureau of Safety, Interstate Commerce Commission.

The Copyright Law of the Philippines, is the title of Copyright Office Bulletin No. 21, issued by the Library of Congress.

Interstate Commerce Rulings—Rates charged on pulpwood, in carloads, from Mack, Mich., to Kaukauna, Wis., were found inapplicable in a recent decision of the Interstate Commerce Commission in Thilmany Pulp & Paper Co. vs. Lake Superior & Ishpeming Rwy., No. 20029, and the applicable rate was found unreasonable.

Rates on printing and wrapping paper, and certain paper articles, in carloads, from Appleton, Eau Claire and other points in Wisconsin to Indianapolis, Ind., were found unreasonable and unduly prejudicial in another decision (No. 19328) and reasonable and nonprejudicial rates prescribed for the future.

Rates on toilet paper and paper towels, in straight or mixed carloads, from Carthage, N. Y., to destinations in specified states in central, western, and southern territories, were found not unreasonable but unduly prejudicial by the Commission, and undue prejudice was ordered removed in National Paper Products Co. vs. N. Y. Central Rwy., No. 18580.

Recent Postal Rulings—Business reply envelopes, mailed under the provisions of the 1928 postage rate laws may now be accepted for registration, with prepayment of registry fees, but still without prepayment of postage. Registry stamps must be affixed in such a manner that they will not cover the permit indicia, pertaining to postage, appearing on the envelopes.

Effective October 1st, the postage rates on business reply cards was reduced from 3 to 2 cents and on business reply envelopes from 4 to 3 cents. This reduction is expected to result in a greater use of them, while at the same time the Postmaster General has liberalized the law by eliminating the requirement of a deposit from mailers and also by removing other restrictions regarding their use. Existing instructions to patrons of the service have also been simplified.

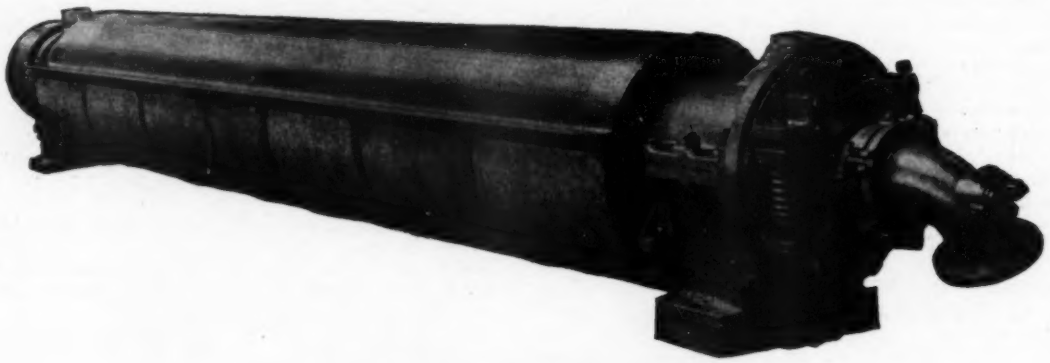
Employment in Manufacturing Industries—Employment in manufacturing industries increased 1.5 per cent in August as compared with July, while pay-roll totals increased 3.2 per cent. Taking 1923 as the basis of 100, the following changes are shown for paper and paper products:

	Employment			Pay-roll totals		
	1927	1928		1927	1928	
	Aug.	July	Aug.	Aug.	July	Aug.
Paper and pringing..	102.4	101.5	101.7	110.6	110.4	110.7
Paper and pulp....	93.2	89.4	90.2	98.0	93.4	96.3
Paper boxes.....	96.3	91.2	91.7	107.2	102.9	104.6

Wholesale Prices—The trend of whosale prices continued upward in August, and when compared with last year were considerably higher in many lines. Taking 1926 as the basis of 100 the following change is shown for paper and pulp:

1927 Aug.	1928 July	1928 Aug.	Purchasing power of the 1926 dollar in August, 1928 (cents)
92.0	89.2	88.8	112.6

New Formula for Computing Column Strength—A new and simple formula for computing accurately the strength of wooden columns commonly used in buildings, etc., has been worked out by the Forest Products Laboratory, Department of Agriculture, and is available upon application by interested parties.



DOMINION
SUCTION PRESS ROLLS
(MILLSPAUGH PATENT)

Of superstrength Bronze for high line pressure operation—

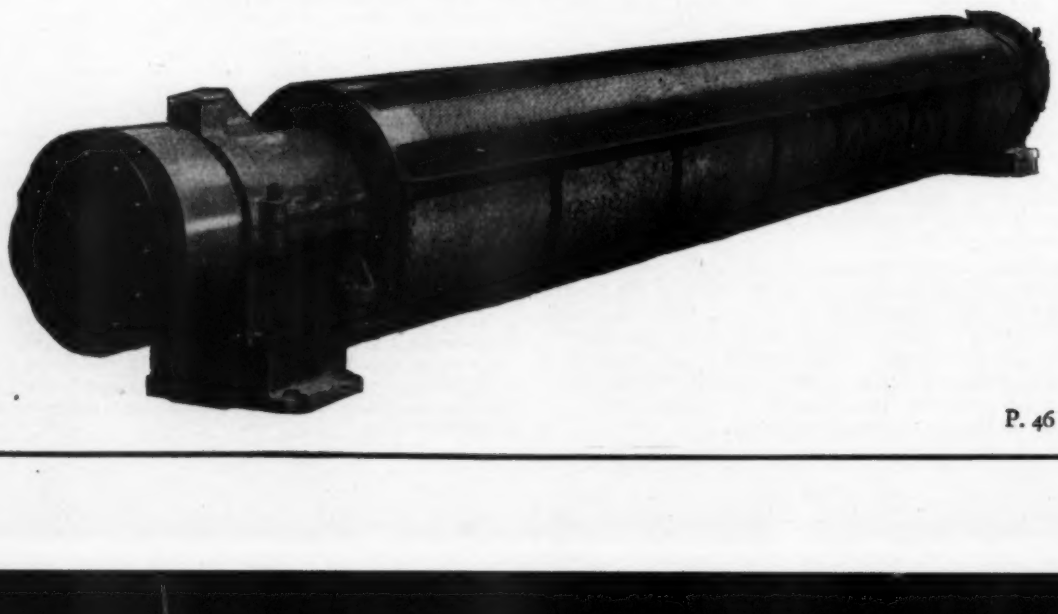
"Dominion" Special Drilling, spiral circumferentially and axially.

Small bearings maintain adjustable feature of suction box to inner surface of roll.

Press Rolls are driven direct without gears, and can be built in any diameters to replace existing Press Rolls without alterations to Drive.

The use of Dominion Suction First and Second Presses ensures safe running and material saving of steam in drying paper.

DOMINION ENGINEERING WORKS
LIMITED
MONTREAL CANADA



P. 46

Canadian News

The Newsprint Situation

A review of the situation regarding the effect of the over-expansion of the newsprint industry on the earnings of the principal companies, leads to the conclusion that the decline in earnings has been in no way proportional to the drastic recession which recently took place in the market value of the newsprint stocks. It is stated that the profits of the leading companies are only fractionally below those of last year.

On the other hand, it is admitted that the recent shading of prices has not been in force long enough to have had much effect, and doubt is expressed as to whether or not there will be further declines in proportionate earnings. Work is going ahead on the immediate construction of two large paper mills in the Maritime Provinces, one in Nova Scotia by the Nesbitt interests of Montreal, and one in New Brunswick by International Paper Co., and this work, combined with other expansions at present under way and nearing completion, dampens the hopes of the industry in general of any improvement in the situation for a long time to come.

Inquiry at the Parliament Buildings in Toronto has revealed the fact that Premier Ferguson of Ontario and Premier Taschereau of Quebec had postponed their proposed conference with Canadian newsprint executives regarding the newsprint situation, which was to have been held early last month. As Premier Ferguson did not meet the Quebec Premier on his way through from England last month, there is some speculation as to whether or not the Ontario Premier will make a special trip to Quebec shortly to have a conference prior to the general meeting with the newsprint men that was scheduled to take place very soon.

No confirmation of this private meeting could be obtained, but it is thought that Premier Ferguson will get in touch with Premier Taschereau before the actual conference with the newsprint manufacturers which was originally scheduled for last month, but which has apparently been indefinitely postponed.

Proposed Newsprint Control Opposed

At present, apparently no progress has been made with the projected conference for the setting up of some system for controlling the output of newsprint. Premier Baxter, of New Brunswick, has thrown one monkey wrench into the machinery by his emphatic declaration that the government of his province will not be a party to limitation of output. Another monkey wrench has been thrown into it by certain of the larger interests in the industry who are said to be in opposition to any action by the governments of the provinces of Ontario and Quebec in the matter.

The understanding was that a preliminary conference would be held between the paper producers so as to arrive at some basis of agreement before the Quebec and Ontario premiers conferred with them as to plans for controlling the situation. It now appears that the paper interest have held their conference and that their views were so opposed that no agreement could be arrived at, the only fact emerging from the conference being that the large producers viewed with distinct disfavor any action whatever by the Provincial government.

Nothing is being given out for publication, and it is difficult to obtain any information, but the conviction is rapidly growing that things are shaping up for a fight to a finish between competing interests, with the possibility that weaker concerns will be forced out of business before the fight is over. It is further intimated, though on what grounds it is impossible to say, that such a fight would not be viewed with disfavor by some of the larger groups.

QUEBEC

Gatineau Power Plant in Operation

The Gatineau Power Co.'s 220,000-volt transmission line for delivery of power between Paugan Falls and Toronto for consumption by the Ontario Hydro-Electric Power Commission in Western Ontario was successfully tested out on September 24th, and delivery of the first block of power was started October 1st. Several interesting features mark the construction of this line. It is the first 220,000-volt line in Canada, and there is no other similar line operating at a higher voltage in the world. The designing, construction and material used were entirely Canadian. The power development of the company is so far advanced that it is in a position to deliver the whole 260,000 h.p. contracted for now if necessary.

As a result of this development, two possessory actions, coupled with a claim for $30,000 damages in each case and also for possession of half of the bed of the Gatineau and Desert Rivers abutting on their respective properties, have been entered in the Hull Superior Court by Auguste Lemieux, K. C., of Ottawa, on behalf of Messrs. James Smith, of Low, Que., and Dennis McSheffrey of the township of Egan, county of Wright, against the Gatineau Power Co.

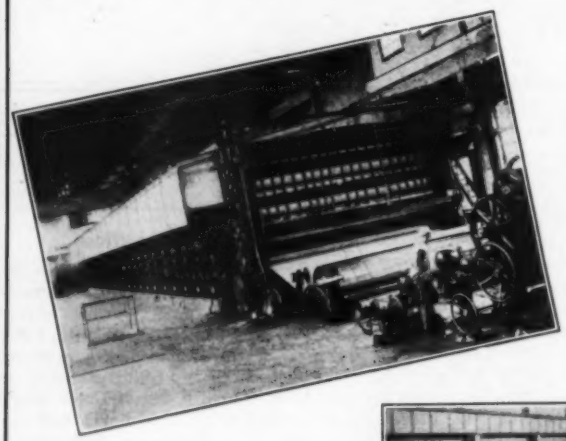
Price and Donnacona in Satisfactory Position

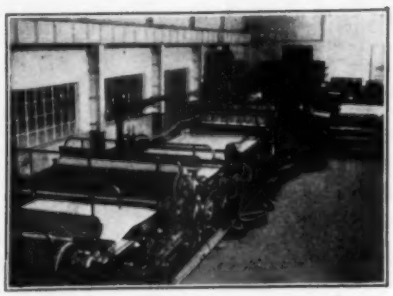
In spite of the hesitancy in the demand for newsprint, the earnings of Price Bros. and Co. during the first five months of the current fiscal year are understood to be but fractionally below the level of former years. Price Bros. concluded five months of the current year's operations at the end of July. The results that have been achieved clearly indicate that the decline in the market value of the stock is due to the speculative outlook for the newsprint industry as a whole.

Recent advices are to the effect that the liquid position of the Donnacona Paper Co. has shown a marked improvement since the beginning of the year when the present company acquired the predecessor organization. Earnings are running at a rate understood to be well in excess of all interest and heavy depreciation charges. The plant will be operating at capacity until the end of 1928, despite the hesitancy of the newsprint market. Donnacona is able to maintain a satisfactory scale of operations at its mill as the company still holds contracts entered into by the predecessor organization. These contracts will not expire until the end of the current year, and some of them only at a later date. The property is being operated under the management of Price Bros. which controls the common stock.

The purchasing department of the Donnacona Paper Co. has been moved from the mill at Donnacona to 56 St. Peter St., Quebec. This change has come about due to the recent amalgamation of Donnocona with Price Bros. Ian Wallace retains his position as purchasing agent for Donnacona, but with his office in the Price Bros. building on St. Peter St. He will handle the entire purchasing for the Donnacona mill as well as for the woods department. Following Price Bros.' practice, with regard to their other mills, it will be necessary to obtain a pass from Mr. Wallace before visiting the mill at Donnacona.

Walter A. Rice, master machinist of the Howard Smith Paper Mills at Beauharnois, was taken ill while on a motor trip in Ontario last month, and died on September 15th at a Hamilton hospital. Mr. Rice, who had been a resident of Beauharnois for the past fifteen years, was in his fifty-ninth year.





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Pyramid Paper Products Acquire MacGregor

Pyramid Paper Products, Ltd., has acquired the assets of the MacGregor Paper Co., Ltd., which recently went into voluntary bankruptcy, and a new company has been formed under the name of MacGregor Paper and Bag Co., Inc. Following the acquisition of the MacGregor interests the head offices of Pyramid Paper Products have been moved to 990 Clarke St., Montreal, the address of the MacGregor Paper Co., where separate offices will be maintained by each organiation.

R. H. Bryan, manager of Pyramid Paper Products, has been appointed manager of the new company, and in addition the following officers have been named: president. F. L. Haves, president of Pyramid Paper Products and of Shipping Containers, Ltd.; vice-president in charge of the Maritime Provvinces and Newfoundland sales, J. L. MacGregor: secrtary-treasurer, M. A. Milne. N. V. Morrison, of the W. J. Bell Paper Co., Toronto, has been appointed a director of Pyramid Paper Products.

As previously, the MacGregor Paper and Bag Co., Inc., will act as wholesalers of wrapping paper, tissue paper, toilet paper and twines.

Fourth Oil Engine Tug for Canadian I. P. Co.

The tug Atacas, the fourth Diesel engine tug built for Canadian International Paper Co., was launched recently at Toronto.

The Atacas will be used for general towing between Hawkesbury and Ottawa. With her trim design and powerful engine, she will make about thirteen knots light. in addition to being capable of handling a large tow. This latest addition to the International Paper fleet is 70 feet overall. 16 feet in breadth, nine feet in depth, with a draft of six feet six inches. It is powered with a 210 h.p. Diesel engine. The vessel is of steel throughout, and has an elliptical stern and straight stem, two water-tight bulkheads. and one division bulkhead. It is electrically lighted, and is provided with efficient pumping and drainage, fire service, ventilation, and heating arrangements.

Frank O. White who has been chief engineer of the plant in Three-Rivers, since the establishment of the St. Lawrence Paper Mills, in 1922, left on September 1st to accept a position as chief engineer for the Fraser Companies. He has been succeeded by Louis A. Dean. Mr. Dean is a former resident of Three Rivers, having acted as assistant manager and resident engineer of the Three Rivers mill of Canadian International Paper for several years. Later, he proceeded to the Gatineau mill with manager J. M. Murray.

T. McAvity Stewart, who is now general manager of Charles Walmsley and Co. (Canada), Ltd., has maintained his connection with Rhodes (Canada), Lt., Montreal. The Rhodes Co. manufacture metal stamping presses of an improved type, a feature of which is the use of the Simplex attachment which is applicable to any press now in use. In addition to this Chas. Walmsley Co. is operating a cadmium and chromium plating department, which occupies a small section of its building and in which a large amount of work is already being done.

Cameron Forms Canadian Subsidiary

The growing business of Cameron Machine Co., in supplying slitting and roll winding machines to the pulp and paper and allied industries in Canada, has necessitated the establishment of a Canadian subsidiary. This has been incorporated under the name of Cameron Machine Co. of Canada, Ltd., with head office in the Drummond Building, Montreal. Manufacturing arrangements have been made with a concern that has built up a world-wide reputation in the manufacture of high-grade machine tools, so that the maintenance of the quality of Cameron machines is assured. It is understood that the special heat treatment of the hardened rolls, on which the score-cuters of the rewinders work, will be furnished by the Brooklyn plant of the patent company.

Harry Hamer, who for the past three years has been on the engineering staff of Charles Walmsley (Canada), Ltd., has joined the company as sales engineer and will represent the Cameron Machine Co. in Canada and Newfoundland.

Arthur A. Scott, formerly with the Abitibi Power and Paper Co. at Iroquois Falls, Ont., is now with the Anglo-Canadian Pulp and Paper Mills at Quebec.

ONTARIO

Dryden Reorganization Deferred

It is thought that the management of the Dryden Paper Co. of Dryden has formulated some plans for lifting the receivership, but that the market recession interferred with these plans. The company will probably be taken out of receivership as soon as market conditions improve, for operating profits of the company are understood to be substantial. There are, however, taxation advantages as long as the company remains in the hands of a receiver.

The mill is now working to its full limit, and it is understood the capacity will be doubled in the near future. A large Canadian paper company not owning a kraft mill, is reported to have made a firm bid of $60.00 per share cash for the control of the Dryden Pulp and Paper Co., but the offer was refused, those in control asking $75 per share.

Abitibi Jottings

Further progress in connection with the wiping out of the underlying bonds of Abitibi Power and Paper Co. to make way for the new first mortgage 5 per cent issue of $50,000,000 has been made by the action of Spanish River Pulp and Paper Mills in calling for redemption of three groups of bonds to a total amount of $3,339,369 out of original issues of $9,000,000, the balance having been previously retired by sinking fund.

The proceeds of the $50,000,000 first mortgage 5 per cent bond issue of the new Abitibi company was recently turned over to the company by the underwriters, and out of the funds received, provision has been made for the redemption of over $45,000.000 of outstanding bonds of Abitibi and its subsidiaries. The substitution of a 5 per cent bond for bonds bearing interest at rates of 5.5 per cent to 7.5 per cent will effect a substantial saving to the company in interest charges each year.

At a recent meeting of the board of directors, the following additional directors were elected: George H. Mead, Dayton, Ohio, chairman; P. B. Wilson, Montreal; George R. Gray, Sault Ste. Marie; T. Watson Sime, Toronto, and T. H. Watson, Toronto. Regular dividends were declared on the common and 6 per cent preferred stocks of the company, payable October 20 to shareholders of record at close of business October 10.

What is regarded as a world record for continuous operation of newsprint machine was made on No. 7 machine at the Iroquois Falls mill during the week of September 9th, when it operated from 10 A. M. Tuesday until 7:10 P. M. Saturday, a total of 105 hours and 10 minutes without a break.

Owing to the present condition of the newsprint market, the Murray Bay division of the company has not yet been brought into production. The groundwood mill, which was previously operated by Donohue Bros., is running at the present time, and installation of the two paper machines which were formerly in the Tidewater Paper Mill, Brooklyn, N. Y., is being proceeded with, so that the whole mill could very quickly be put into operating condition, the necessary sulphite being shipped by water from the Beaupré Division, 60 miles up the St. Lawrence from Murray Bay.

Hinde and Dauch Anticipate Further Expansion

Hinde and Dauch Paper Co. of Canada, with plants at Toronto and Trenton, is reported to be enjoying a very satisfactory business and operating at a high capacity rate. Although the Trenton mill has only recently been brought into production, the company's business throughout the west is reported to be increasing so steadily that establishment of a

WANTON WASTE Stop It!

The Briner Economizer

is the logical and accepted method of eliminating this costly waste of heat. Chief advantages derived from its operation are:

Reduced cost of steam per pound of paper.

Reduced load on boiler and elimination of peaks during extreme cold weather.

Increase in both quantity and quality of production.

Failure to detect all the hidden sources of waste in a paper mill is to be excused in the stress of capacity production.

But there never was a time in the history of the industry when the recovery and utilization of waste heat was more imperative.

Every mill man knows that a sufficient amount of heated air is absolutely necessary in the operation of the machine room. He knows that it costs real money for every thousand pounds of steam that heats this air. He knows that the vapor from his machine carries off vast quantities of heat units through the vents to the outside air—as waste.

Failure to take steps to reclaim these heat units and to fully utilize them—is permitting excessive steam cost and wanton waste.

STOP IT!

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ROSS ENGINEERING OF CANADA, LIMITED
NEW BIRKS BLDG., MONTREAL

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new plant to serve that territory is being considered. It is understood that a number of sites for the new plant are being considered in the vicinity of Winnipeg, Man., and that if a suitable location can be found a plant will be located at that point. So far as can be learned no additional financing will be required to take care of this development.

The company ranks among the largest manufacturers in Canada of fiber shipping boxes and corrugated paper products, and is also one of the largest producers in Canada of straw paper for corrugated purposes. Its customers include the largest buyers of package goods in the country, and its field is served by sales offices located in all important cities. The strawboard plant which was brought into operation at Trenton in November last was erected and equipped at a cost of $850,000. It is not yet possible to indicate just what type of mill will be constructed at Winnipeg if the decision is reached to go ahead with this development.

I. P. Co. Investigates Mill Sites

International Paper Co., which is contemplating the erection of a pulp and paper mill at the head of the Great Lakes, is investigating the relative advantages of Nipigon, Port Arthur and Port William as the site of the projected mill. When the required data have been collected they will be forwarded to the company's head office in New York for examination and decision.

It is understood that Nipigon has been found satisfactory for a mill of the size proposed by this company and it is believed that the site at Port Arthur, between the mills of the Thunder Bay and the Provincial Paper companies, will be found equally adequate. Port Arthur derives its advantages from the point of employment and better conditions for workers. This condition, however, would have to be balanced against the fact that the cost of pulpwood would be reduced by almost one dollar a cord at Nipigon.

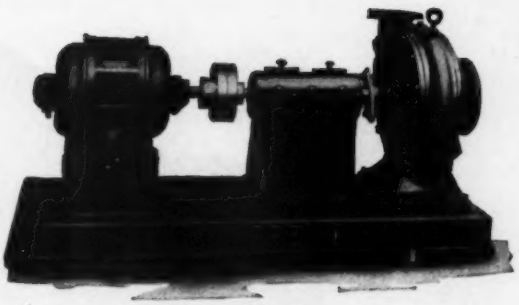
The Poupore Lumber Co., of Gogama, has been awarded the right to cut red and white pine and jackpine in the townships of Chester and Neville, district of Sudbury. Hon. William Finlayson, Minister of Lands and Forests for Ontario, announced that the sale price of the red and white pine was $10 per 1,000 feet, and of the jackpine $6.50 per 1,000 feet. The total quantity in the two townships is 5,500,000 feet of red and white pine and 16,000,000 feet of jackpine.

Last month, Hon. William Finlayson, Ontario Minister of Lands and Forests, made an aeroplane inspection of the northern part of the province in one of the forestry patrol planes piloted by Captain Roy Maxwell, director of the service. The Minister covered 3,000 miles in four days and visited Albany, Rupert House, Orient Bay, Sioux Lookout, Red Lake, Woman Lake and Moose Factory. It is the most complete and comprehensive trip of this nature ever undertaken by any minister of the Provincial Government. Mr. Finlayson was primarily interested in the fire hazard, which is more menacing than usual this year owing to the exceptionally dry summer in the district of Patricia and to the rush of prospectors to the northwest of the Province, near the Manitoba boundary.

Kapuskasing Mill in Operation

The new mill of the Kimberly Clark Corp. at Kapuskasing, the largest individual newsprint unit to be installed during the present year in Canada, was officially opened September 18 and 19, in the presence of Hon. Wm. Finlayson, Ontario Minister of Lands and Forests; F. J. Sensenbrenner, president of the company, Adolph S. Ochs, president of the New York Times, and many other interested parties.

The New York Times had contracted for the output of this mill, beginning January 1st, 1929. However, a co-operative arrangement is said to have been affected by which the Mersey Paper Co. Ltd., now building a large paper mill in Nova Scotia will fill the New York Times contract for the Kimberly Clark Corp. In return, the Kimberly Clark mill at Kapuskasing will supply newsprint for the Mail and Empire newspaper in Toronto, which is owned by one of the



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Easily renewable case liners make it possible to maintain a close running clearance between impeller and sides.

Sturdy, massive single pedestal supports both plain and thrust bearings assuring perfect alignment.

Shaft extra large at impeller and bearings to prevent vibration and deflection.

Designed by engineers thoroughly familiar with the problems of handling stock—Warren Stuff Pumps move the stuff quickly, efficiently, without clogging and without requiring a lot of attention. Ask us to show you what they have done handling your kind of stock.

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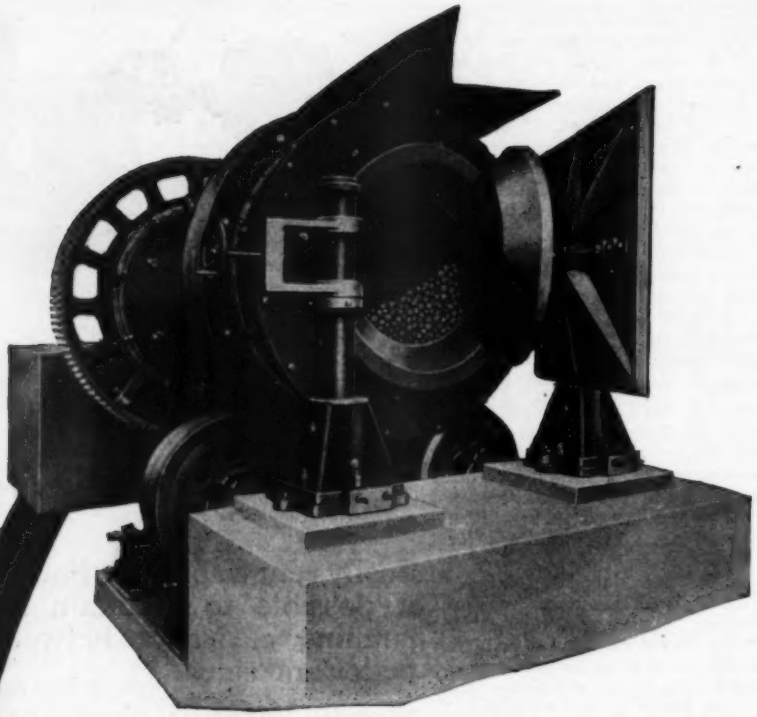

To Makers of Greaseproof Papers

BY using the Marcy *Open End* Rod Mill as the equipment for this new process of "beating with rods", two distinct improvements will result:

1. Better fibers will be produced.
2. Much less power (50% less or even better) will be consumed in producing these better fibers.

Better fibers will be produced because a thicker pulp combined with a low pulp line is used. The Marcy Mill avoids the use of thin mixtures which often cause over-treatment; it eliminates deep baths or pools that cause under-treatment.

Less power is consumed because the fibers are in the mill only comparatively a short time, because less volume (per pound of fiber) is handled, because a single Marcy Mill can handle a tonnage equal to that of several ordinary beaters.

Better fibers with less power mean a better paper at a lower cost.

Marcy Mill engineers will be glad to outline in detail the improvement to be expected in your mill.

Send for this bulletin. It carries interesting information.

The MINE and SMELTER SUPPLY COMPANY

Licensee under the Marcy Rod Mill Patents.

NEW YORK DENVER

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promoters of the Mersey Paper Co. Ltd. This arrangement will mean a substantial saving in freight costs for both companies.

Charles E. Campbell, the Edmonton, Alta., publisher who was given judgment by Justice McEvoy against E. A. Wallberg, Toronto, and the Lake St. John Power and Paper Co. for one per cent commission on potential sales of $40,000,000 worth of newsprint, has filed an appeal, claiming that he is entitled to two per cent commission. E. A. Wallberg and the Lake St. John Power and Paper Co. have also filed an appeal against the judgment, declaring that the judge drew improper inferences from the evidence and that the state of fraud was applicable to the contract in question.

Algoma to Build at Michipicoten

The Algoma Pulp, Paper and Dock Co., Ltd., operating under an Ontario charter, but with head offices in London, England, and whose prospectus was recently submitted to the public, is acquiring an option to purchase the capital stock of Austin and Nicholson, Ltd., Chapleau, Ont., as a result of which it will acquire the timber and pulpwood business carried on by that company, together with the licenses granted by the Ontario Government for cutting pine timber and pulpwood on 779 square miles of Crown lands in the Province of Ontario. The total value of the timber is placed at $7,700,000 and the total value of the plant and equipment to be acquired is $1,500,000.

The new holders propose to construct a dock at Michipicoten harbor capable of handling 250,000 tons of coal per season, and a fully equipped newsprint mill with a capacity of 200 tons per day. Total profits, when the dock and paper mills are in full operation, are estimated at 323,300 pounds sterling. The share capital consists of 400,000 eight per cent participating preference shares of one pound par value each, and 2,000,000 ordinary shares without par value, the preference shares being entitled to one-third of the remaining profits available for distribution after payment of their non-cumulative fixed dividend.

Thunder Bay Paper Co.

The first shipment of newsprint made by the Thunder Bay Paper Co. direct to Chicago by steamer loaded out of the new shed at Port Arthur recently. The boat, the Francis L. Robbins, was lately acquired by the Newaygo Tug and Towing Line, a subsidiary of the Consolidated Water Power and Paper Co. The shipment contained 1904 tons of paper, aproximately sixty-nine carloads, valued at $120,000. It was consigned to the Consolidated Water Power and Paper Co., Chicago division. Other paper cargoes will be shipped from the plant during the balance of the season. The steamer Robbins was purchased from the Becker Steamship Co. and reconditioned, and is able to carry 3,000 tons of newsprint. The name of the steamer is to be changed to the George W. Mead in honor of the president of the company.

An engineering feat unique in Canadian industry has been carried out successfully in the construction of a ten-inch cast iron pipe through which groundwood pulp in slush form will be pumped from the groundwood mill of this company at Current River to the paper mill two miles away. Tests which were carried out last month were declared to have given highly satisfactory results.

MANITOBA

In accordance with the recommendation of the Provincial Cabinet, the Federal Cabinet has passed an order-in-council providing that the Seven Sisters power site be leased for a period of fifty years to the Northwestern Power Co., a subsidiary of the Winnipeg Electric Railway Co. Following the meeting of the cabinet, N. W. McClymont, president of the Winnipeg Electric, who was in Ottawa, announced that work would commence at once, starting with the construction of a fourteen-Mile railway line from the C. P. R. to the power

Who reads BLACK AND WHITE?

It is read by a great army of workers in the paper industry as well as other industrial men who are interested in the subjects treated in its pages such as :—

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PI-B&W-58

The Norton Pulp Stone

NORTON Pulp Stones are constructed of vitrified blocks of Crystolon abrasive securely fastened to a cast iron drum. The spaces between the blocks are filled with a special alloy which wears down uniformly with the stone. The whole assembly is designed to be mounted on your standard shaft and driven with your standard flanges.

The major advantages of this manufactured stone over the quarried product are: extremely long life, low stone cost per ton of pulp, a high grade of pulp and uniform quality of stone.

NORTON COMPANY, Worcester, Mass.

Canadian Trade Now Supplied from Canadian Plant

NORTON

Grinding Wheels
Grinding Machines

Refractories-Floor
and Stair Tiles

site and a transmission line from Pinewa. Work at the site itself will be undertaken as soon as possible, and the new plant, which will have a capacity of 132,000 h.p. will be completed by the middle of 1930, at an expenditure of between seven and eight million dollars.

BRITISH COLUMBIA

Large Mills Projected for Prince George

According to a Vancouver dispatch, the establishment of a large pulp and paper industry at Prince George, including probably the largest paper mill in the Province, is virtually assured. The Fraser Companies, Ltd., which has been negotiating with the Provincial Government since 1921 on these plans, is now preparing to go ahead with them, according to advices received from Hon. F. P. Burden, Minister of Lands and member of the Legislature for Fort George. Representatives of the company, which is composed of leading eastern Canadian financiers, will, it is said, shortly go to Vancouver to ask the Government to approve part of their project, which involves a permanent timber supply.

The results of this scheme will be far-reaching, and as the freight to be moved in and out of the northern city to serve the needs of a mill of the size proposed will be heavy, this fact undoubtedly will have a big bearing on the future of the Pacific Great Eastern Railway. Reports that the Fraser Companies intended to ship its paper to Eastern Canada, are claimed erroneous. Its output will go to tidewater on the Pacific by the most satisfactory route obtainable, and the Pacific Great Eastern will have an opportunity of securing this business, or a large part of it. In addition, it is expected a large volume of supplies for the industry, and for the hundreds of workers engaged in it, will move from Vancouver.

Preparations for the establishment of a mill capable of producing about 600 tons of pulp and paper a day, have been proceeding quietly in the last few months. The syndicate promoting the scheme has held large timber areas in the Prince George district for many years, but it is understood will secure additional stands from the Government. Meanwhile, surveys of a power site on the Nechaco River were completed a few months ago and found satisfactory. Sufficient power can be secured to operate the mill of the size planned, engineers have reported.

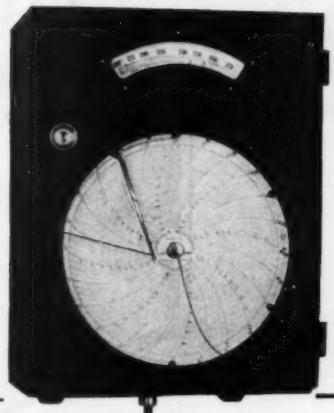
The New Westminster Paper Mills, of which H. M. Lord is manager, are running twenty-four hours a day owing to increased demand for their products. All departments of the plant are operating day and night and it likely will be necessary to continue the extra shifts for some time. Partly responsible for the big rush which is being experienced by the firm is the market for fruit wraps developed in the Okanagan Valley. This year a large proportion of the fruit produced in the province will be wrapped in paper produced at the New Westminster plant. The export business is also increasing and large shipments of fruit wraps, wrapping and other varieties of paper have been made to New Zealand within the past few months. There has also been a steady increase in the local demand for the various products of the concern.

NEW BRUNSWICK

Second Papermaking School at Edmundston

According to a statement recently issued by W. K. Tibert, director of vocational education for the Province, a pulp and paper school, the second of its type in the Dominion, has been organized at Edmundston.

The new course, which will be opened by the vocational division of the Department of Education as soon as a suitable instructor is obtained, will be held in the composite



The compact, convenient make-up of this new Bristol's Instrument makes it very easy to install and maintain.

The New
BRISTOL'S
Recorder-Controller

For important processes thruout pulp and paper mills which demand the maintenance of definitely uniform temperatures the instrument illustrated offers a fine opportunity for increased savings.

As the name implies, this instrument is designed to simultaneously control temperatures and provide a record of the temperatures maintained under such control.

Both recording and control units are mounted in the same case, but operate entirely independent of each other. Thus there is no chance for the temperature record to become impaired in the slightest degree as a result of any retarding effect of the controller—an absolutely true reading is assured both above and below the control point.

The control mechanism of this instrument functions similarly to that of other Bristol's Automatic Temperature Control Equipment, i. e., to actuate motor-driven or solenoid controller valves in such a manner as to automatically regulate the flow of air, gas, oil, steam, electricity, etc. This particular instrument is adapted for use on control jobs ranging up to 1000°F. Very easy to install and maintain.

For more complete information consult Bristol's Engineering Service. There's no obligation.

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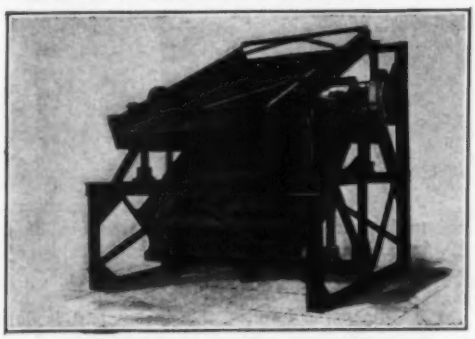
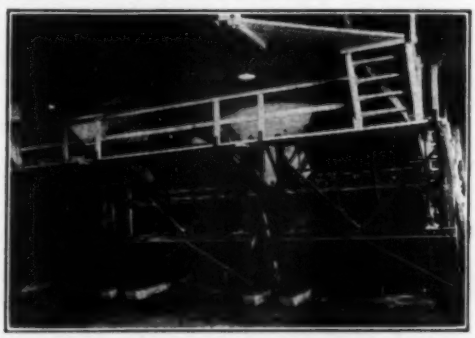
CARTHAGE N.Y.

RYTHER CHIP SCREEN



All steel construction
Floor space 10 feet square,
high capacity, 2 H. P. per unit.



Showing rear view of three
Ryther Chip Screens operating
in multiple, 25 cords per hour.

WOOD CHIP BREAKER

Chips treated by the Wood Ideal Chip Breaker installed under the chipper hood are uniform in size, thoroughly separated, dusted free and clean, ready for screening.

FOR CANADA REFER

CANADIAN INGERSOLL-RAND COMPANY, LIMITED
10 PHILLIPS SQUARE, MONTREAL, P. Q.

school, will accommodate a maximum of thirty students, and will be of eight months' duration. The pulp and paper school will be similar in scope to that conducted by the Quebec Department of Lands and Forests at Three Rivers. Although an outgrowth of the night school course, the new school will be distinct from it in every way.

The proposition has received full support from the Fraser Companies, which were instrumental in having the original course established.

E. H. Gunn, of the engineering staff of the Lake St. John Power and Paper Co., at Dolbeau, Que., has left to begin his new work in connection with the building of the New Brunswick International Paper Co.'s new mill at Dalhousie.

George H. Waring, Jr., has been appointed manager of the Saint John Iron Works, at Saint John. This plant has been taken over by the James Playfair interests of Midland, Ont., which control the St. John Drydock and Shipbuilding Co. of East St. John. Mr. Waring was, for some years, mechanical superintendent of the Partington Pulp and Paper Co. plant at Fairville, the name of which has since been changed to Nashwaak Pulp and Paper Co. Later he was manager of the Union Iron Foundry at West St. John.

R. W. Hovey, general manager of the Nashwaak Pulp and Paper Co., Fairville, has, for the past few months, been making his headquarters in New York City, at the head offices of the Nashwaak Pulp and Paper Co. and the parent company, the Oxford Paper Co.

NOVA SCOTIA

Export of Raw Pulpwood Condemned

Hon. R. B. Bennett of Calgary, leader of the opposition in the House of Commons at Ottawa, who recently completed an intensive tour of his homeland, the Maritime Provinces, incorporated references to the pulp and paper industry in practically all of his addresses. Of keen interest to him is the activity at Brooklyn, N. S., where a big pulp and paper mill is being established by The Mersey Paper Co., Ltd. Mr. Bennett stated that he hoped the erection and operation of this great plant would reduce the flow of pulpwood out of the province of Nova Scotia to the United States, the export volume now reaching 200,000 cords annually.

Mr. Bennett repeatedly criticized the export in large quantities of pulpwood from Canada to the United States, saying the Dominion was prodigal in the exportation of raw material. He expressed himself as unalterably opposed to continuance of the flow of pulpwood.

The Toronto Harbor Commissioners have announced the completion of negotiations with the Victoria Paper and Twine Co., Ltd., for the acquisition of a Fleet St. location as a site for a new warehouse to be erected by the company. The site which has been acquired has a frontage of 84 feet by a depth of 133 feet. The new warehouse will practically cover the whole parcel.

Canadian Forester Goes to Australia

L. MacIntosh Ellis, B. F. C., a graduate of the Faculty of Forestry, University of Toronto, who has many friends in the paper trade in Toronto, now has his headquarters at Sydney, Australia. Mr. Ellis has held many important positions, and for the last eight years was director of forestry for the Government of the Dominion of New Zealand, and chief of the State Forest Service. He retired a few months ago to become affiliated in consulting and operating capacities with industrial forestry interests in Australia.

Mr. Ellis is president of the New Zealand Institute of Foresters, a member of the Society of Foresters of Great Britain, and a senior member of the Society of American Foresters. He is also a Fellow of the Royal Geographical Society.

RYERSON

Immediate Shipment from Stock

Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

Write for the Journal and Stock List—the "key" to Immediate Steel.

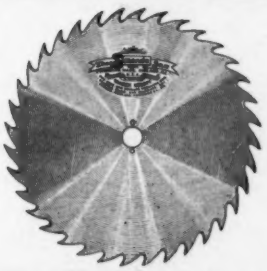
JOSEPH T. RYERSON & SON INC.

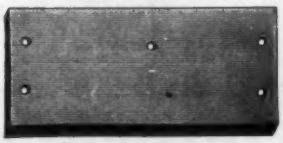
Chicago Milwaukee Buffalo St. Louis New York Cincinnati Boston Detroit

STEEL

SIMONDS

Circular Saws and Machine Knives





For pulp and paper mills it is economy to use Simonds Saws and Barker, Chipper and Paper Cutter Knives because they hold their edge longer and cut faster. They are backed by a near century of experience. Write for catalogue and prices.

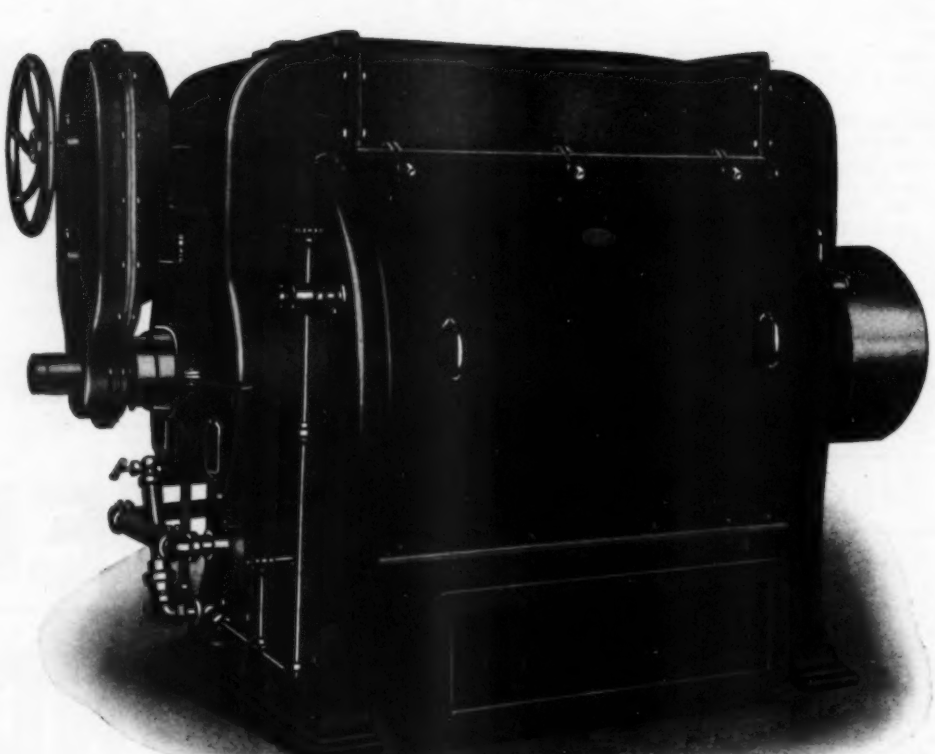
Simonds Saw and Steel Co.

Established 1832
Fitchburg, Mass.

Boston Chicago

REED-SPAFFORD PULP SCREEN

(Built in two sizes)



The REED-SPAFFORD PULP SCREEN is remarkably efficient. Its capacity is large and its power consumption is surprisingly low. Let us show you what a saving this screen means to you.

Our Paper and Pulp Machinery is CONSTANTLY IMPROVED

Improved Paper Machinery Co.

Nashua, N. H., U. S. A.

SHERBROOKE MACHINERY CO., Limited

Sherbrooke, Quebec, Canada

WISCONSIN NEWS

Activity in Reforestation

Self preservation with respect to a future pulpwood supply is becoming more and more of an objective of paper mills in Wisconsin. With the planting of 600,000 trees this season by two companies, reforestation has taken a decidedly practical turn. These plantings, added to smaller amounts a year ago, will grow into a count of millions as the program is increased in the future. Within forty years it is estimated that mills will be cutting a pulp wood supply from this source.

Leaders in this movement are the Nekoosa-Edwards Paper Co., of Port Edwards. F. G. Kilp is retained as forester and is directing the planting of 500,000 trees, mostly of the jack pine variety. Large tracts of land near Nepco lake (created by impounding waters above a new dam) have been set aside for this purpose, in addition to some acreage in Ashland and Sawyer counties. The total area for this planting is about 1,000 acres.

The company has developed a tree nursery consisting of 175 beds of seedlings, and many of these are being transplanted. Some Scotch pine is being grown for experimental purposes, and the company also will grow Norway pine and spruce, and some native white pine and spruce. It is estimated that the company will have 4,000,000 trees growing when its program gets further under way, and hopes to begin cutting in about 40 years.

Another extensive reforestation project is being carried on by the Tomahawk Kraft Paper Co., of Tomahawk, Wis., under the direction of C. G. McLaren. forester. Plantings this fall will amount to 100,000 trees and the program as a whole takes in 20,000 acres of land which will be used for this purpose. Here again the main plantings are of jack pine so that a rapidly growing variety will assure a pulp wood supply when it perhaps may be needed badly.

These rapid strides are accounted for by Wisconsin's new severance tax law, which removes the customary property tax and exacts payment only when the timber is cut. Reforestation efforts began at once and this is the second year of such work.

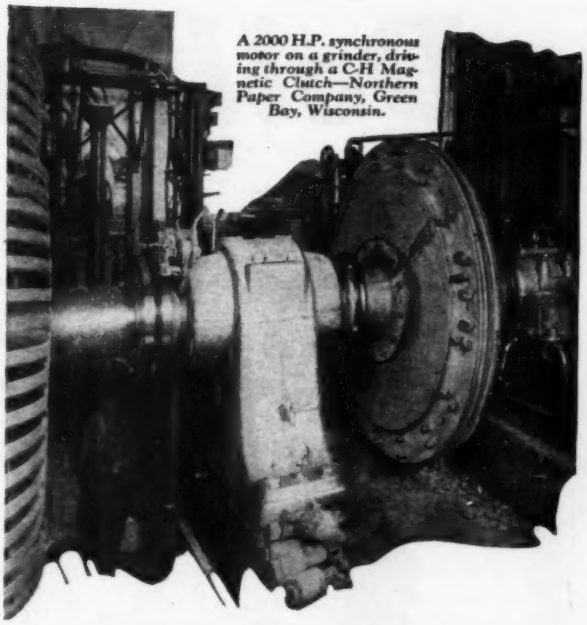
Safety News

Safety checks of five dollars each were paid to 139 employees of the Kimberly-Clark Corporation of Neenah, Wis., last month. These men all work at the Atlas mill at Appleton, Wis., and received this reward because of a no-accident record over a given period. The company does this to all of its mills, and to entire departments that are free from accidents.

Speakers from several lines of industry have been engaged for the evening classes which will be held for the first time this year at the vocational school at Menasha, Wis. Superintendents, foremen and employees from paper mills and other plants in both Menasha and Neenah, Wis., will attend. Co-operating concerns are: Banta Publishing Co., Kimberly-Clark Corp., Menasha Paper Mills Co., Menasha Products Co., Wisconsin Tissue Co., Menasha Wooden Ware Co., and Gilbert Paper Company.

L. Sagemuller, manager of the Meteor Oil Company, Milwaukee, Wis., will be the first speaker and his subject will be, "Safety and Your Responsibility." R. G. Knutson, of the Wisconsin Industrial Commission, is to speak on "The Success of Safety." Other speakers and their subjects are: "Fire," Harry K. Rogers, of the Western Actuarial Bureau, Chicago; "Health and Production," Dr. Thompson, chief surgeon, Chicago and Northwestern Railway; "Safety and Efficiency," F. A. Lauerman, of the Interstate Iron and Steel Co., Chicago; "Breaking in the New Man," C. B. Boulet, of the Wisconsin Public Service Corp., Milwaukee. A special dinner program is arranged for Dec. 3 at which John Callahan, state superintendent of schools, will give the principal address.

Safety schools also will be held at Appleton and Green Bay, Wis., as in other years, with experts in various lines of safety as speakers. Excellent courses have been arranged



A 2000 H.P. synchronous motor on a grinder, driving through a C-H Magnetic Clutch—Northern Paper Company, Green Bay, Wisconsin.

C-H Clutches

—the answer to high starting torque

Heavy starting loads no longer need to limit the use of synchronous motors in your plant. Incorporate a C-H Magnetic Clutch in the drive and the question of starting is solved—regardless of torque.

For a C-H Clutch allows the motor to attain full speed before the load is connected. And because the holding power of a C-H Magnetic Clutch builds up gradually, the load is always started smoothly—without grab, jerk or jar.

No other clutch is so smooth in operation—so simple and trouble-free—and in addition C-H Clutches can be remote controlled by a push-button located anywhere.

All the many advantages of C-H Magnetic Clutches on grinder, beater, and other paper mill drives are fully explained in the special paper mill booklet—Pub. No. P-27. You should have a copy.

The CUTLER-HAMMER Mfg. Co.

Pioneer Manufacturers of Electric Control Apparatus

1273 St. Paul Avenue

MILWAUKEE, WISCONSIN

CUTLER HAMMER

Magnetic Clutches Save Time and Save Equipment

~Dollars Saved on Steam Costs~

Just as Important as dollars Saved in any other way~

Mills check the B.T.U. in the coal they buy and fight for the last red cent on the price they pay. That's good business.

But why stop there? Why put up with a drying condition on your paper machine that you know to be faulty, and waste that "well-bought" coal on excessive steam costs?

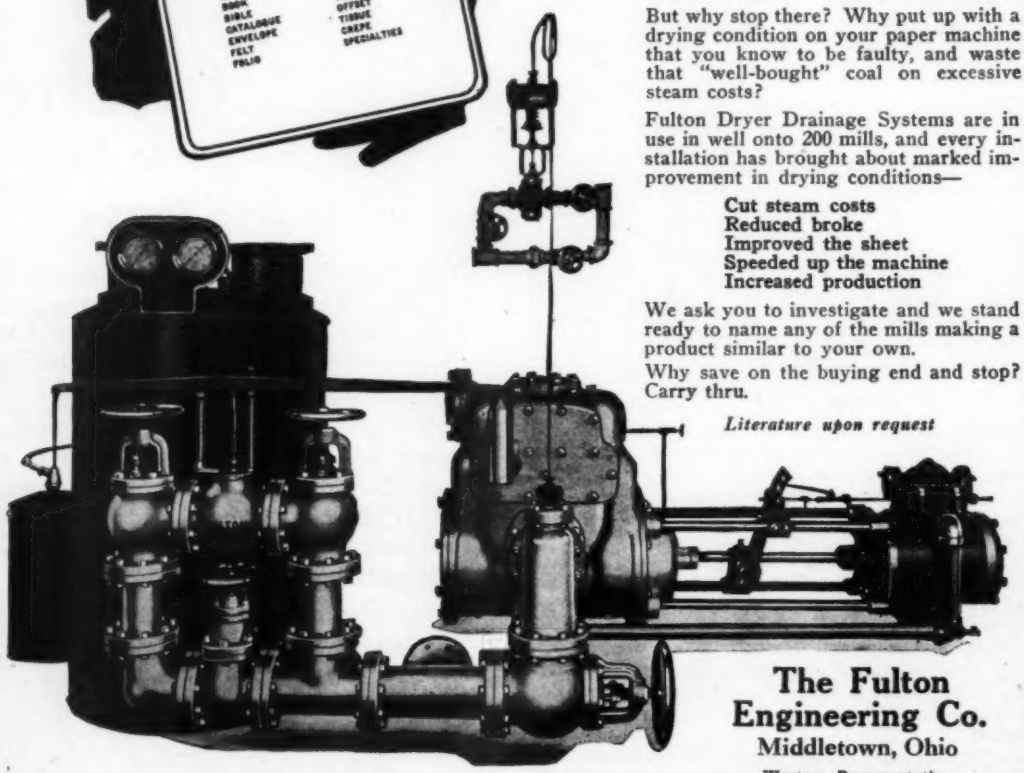
Fulton Dryer Drainage Systems are in use in well onto 200 mills, and every installation has brought about marked improvement in drying conditions—

Cut steam costs
Reduced broke
Improved the sheet
Speeded up the machine
Increased production

We ask you to investigate and we stand ready to name any of the mills making a product similar to your own.

Why save on the buying end and stop? Carry thru.

Literature upon request



The Fulton Engineering Co.
Middletown, Ohio

Western Representative
WOODBURY & WHEELER CO.
55 2nd St., Portland, Ore.

Fulton
Dryer Drainage Systems

for this year by H. G. Noyes, state director of paper and pulp mill education, and the attendance probably will be larger than ever.

Another specially arranged course for evening classes will be held at Appleton and will deal entirely with the care and maintenance of pumps. Maintenance men, especially millwrights and mechanics, will be enrolled and will be taught the complete technical side of this matter. E. B. Morse, secretary of the Hayton Pump and Blower Co., Appleton, will be the instructor.

Several improvements have been completed by the Kimberly-Clark Corp. at its mill at Niagara Falls, N. Y. Another crepe-wadding machine has been installed and started on production, so that four machines are now supplying this product. The new machine turns out 600 feet of wadding a minute. The company also has completed enlargement of its office building and now enjoys adequate facilities. On the first floor are the maintenance department, men's washroom, operators' headquarters, employment and first aid departments, and the office of J. L. Sensenbrenner, mill manager. The stenographic and statistical departments are on the second floor and an attractive girls' rest room also is located there.

Organization of the Mutual Benefit Society has been completed by the Spruce Falls Pulp and Paper Co., Ltd., of Canada, a subsidiary of the Kimberly-Clark Corp. The president is S. R. Stilp, the vice president is E. S. Noble, and the secretary, F. A. Robinson. Employees' representatives are F. M. Helston, H. N. Baker, G. Ince, C. L. Russell and H. D. Hyman. Protection is afforded employees from death and illness, and 545 so far are enrolled.

Following a "horse play" accident, Alvin Schinke, an employee of the Fox River Paper Co., Appleton, Wis., is held for trial for fourth degree manslaughter. He is held responsible for rupturing the intestines of Edward Gastrock, a fellow employee, with an air hose and causing his death. The hose, with 80 pounds of pressure, was being used by the crew for removing lime dust from their clothing after unloading a car.

Improvements at Consolidated Plant

Repairs and improvements made recently at the main mill of the Consolidated Water Power and Paper Co., Wisconsin Rapids, Wis., have facilitated production considerably. Quite a number of changes were accomplished while the machines were down when new thrash racks of steel were being built to replace worn out wooden ones in front of the grinder wheels. It was necessary to open all gates on the dam and drain down the reservoir.

Machines Nos. 1 and 2 were supplied with new Beloit suction rolls, and new fourdriniers equipped with Beloit high speed shakes. The fourdriniers are equipped with roller bearing breast rolls and tube rolls and have a wire length of 85 feet. The former wire length was 65 feet. Smoothing rolls also were added to give greater finish to the sheet.

Another important change on machine No. 1 was the widening out of the sheet so it trims 126 inches instead of 122½. No. 2 machine remains the same as before with 122½-inch trim. The latter has been equipped with two new calender stacks and a new x drum reel.

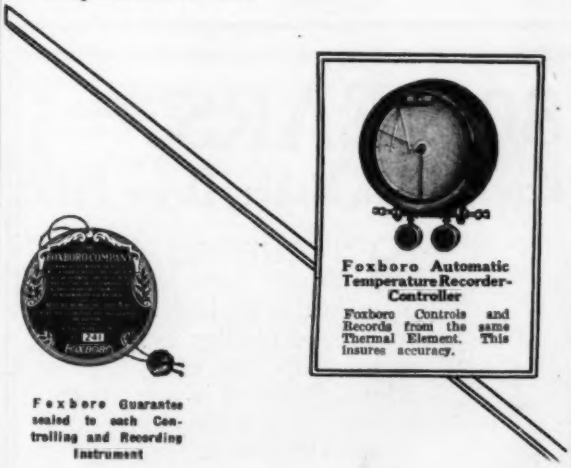
New hoods were placed over these two machines, and a false ceiling was installed in the machine room so as to improve its appearance.

Pulpwood shipments across Lake Superior from Canada to Ashland, Wis., have been completed for the season by the tug "Butterfield," of the Consolidated Water Power and Paper Co., Wisconsin Rapids, Wis. Six rafts were brought across without mishap, convoying about 72,000 cords of wood.

Part of the timber holdings in Wisconsin of the Continental Bag and Paper Company, of New York, have been sold. The Shawano Lumber Company, of Shawano, Wis., purchased from them a tract of 1200 acres near Argonne, Wis. The tract contains mostly hardwoods.

YOU
Deliver the Steam
and Leave the Rest to Foxboro

WHEREVER a paper mill uses steam for process work a Foxboro Recorder-Controller keeps temperatures just where you want them. On the drying rolls, digestors or rag boilers, for example, you need not worry about overheating. Put a Foxboro Instrument in the steam line, tell it the temperature you expect and the next day look at the temperature chart and see how faithfully the instrument has done its duty. You will find a record of perfect temperature control.



Foxboro Automatic Temperature Recorder-Controller
Foxboro Controls and Records from the same Thermal Element. This insures accuracy.

Foxboro Guarantee sealed to each Controlling and Recording Instrument

THE FOXBORO COMPANY
Neponset Avenue, Foxboro, Mass., U.S.A.
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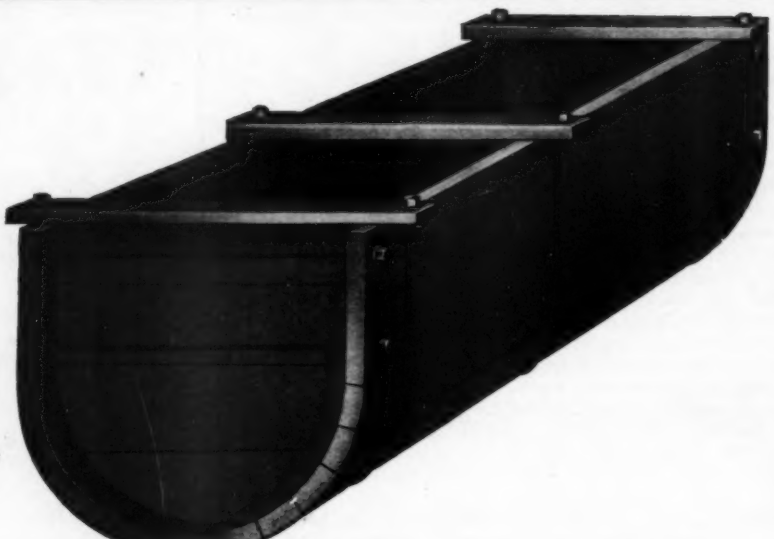
FOXBORO
REG. U. S. PAT. OFF.
THE COMPASS OF INDUSTRY
INSTRUMENTS FOR CONTROLLING, RECORDING AND INDICATING TEMPERATURE, FLOW, HUMIDITY AND PRESSURE

TANKS
of every description

We are equipped to build any sort of a wood tank for use in paper plants.

Let our engineering department assist you in solving your tank problems.



The A. T. Stearns Lumber Co.
NEPONSET, BOSTON, MASS.

EVERYTHING IN WOOD OR WOODWORK 1849

STEARNS TANKS

80 YEARS'—
Experience in Making Dryer Felts

FITCHBURG Cotton Dryer Felts have conformed to the highest standards of quality and workmanship for over eighty years. This is one reason why today they are used so extensively.

¶ Manufactured in English weave, two, three, four, five and six ply, from 60 to 210 inches in width.

¶ Fine faced felts for fine papers. For coarse papers, use "Triune" three-ply Felts —**they're dependable.**

FITCHBURG DUCK MILLS
ESTABLISHED 1844

54 Duck Mill Road FITCHBURG, MASS.

Pickles' Patent Automatic Steam Regulator FOR Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

W. F. PICKLES Buckland, Conn.

RODNEY HUNT

Turbine Water Wheels
for Mill and Hydro-Electric Service

93.38% Efficiency in Official Holyoke Test

A Record-breaking Performance

Means More Power from the Same Water

Water sealed oil lubricated casings

Also Dependable Canal Equipment "From Dam to Tail-race"

Request Catalog

RODNEY HUNT MACHINE CO., 38 River St., Orange, Mass.

NEW ENGLAND NEWS

Bankers Recommend Great Northern Stock

For the first time since the formation of the Great Northern Paper Co., bankers in Boston have actively advertised and urged the purchase of the company's stock. Describing Great Northern as the outstanding success in New England industry, Baker Young & Co., of Boston show that the Great Northern is actually making a handsome profit on present prices of newsprint paper that has been actually unremunerative to other corporations.

The Great Northern utilizes but one and one-half men per ton of newsprint compared to the three and four men used elsewhere. The reasons for this are manifold. The company has no transportation problems for its essential raw material. It obtains practically all of its pulpwood by river drives and its 1,300,000 acres of timberland are located on waters which are either directly tributary to the mills or linked through owned railroad and steamboat lines. The company has no funded debt and is turning half its surplus every year back into the company. It has developed 60,000 hydroelectric horsepower and has nearly 400,000 that can be developed when markets are available.

N. E. Shippers Board Reports Good Business

The Tenth Regular Meeting of the New England Shippers Regional Advisory Board was held at the Stratfield, Bridgeport, Conn., on September 21st. The report of the anticipated movement of commodities was reported by each industrial committee chairman. For paper and pulp, Pat J. Dowd of the Holyoke Traffic Bureau and C. L. Whittemore of the New England Paper & Pulp Traffic Association reported as follows: For newsprint and printing paper in New England, present operations at practically full capacity, with every indication of a continuance at capacity production for the coming year; printing paper, book paper, box boards, and writing paper industries will show an increase for the last quarter of approximately 5 per cent for the coming year; envelopes, papetries, tissue paper and napkins indicate an approximate increase of 5 to 10 per cent in production as compared with the same quarter of 1927; pads, tablets and blank books will be approximately equal to the corresponding months of 1927; pulp board and straw board production is expected at full capacity during the coming quarter.

In regard to imported woodpulp the Paper and Pulp Committee stated that the receipts at New England ports will run 10 to 15 per cent higher during October, November and December of this year than during the same period last year. The railroad service can be summed up with the following views of the paper committee: "Business of several companies has been strengthened somewhat by the very excellent railroad service rendered, enabling paper mills to make prompt deliveries which is an important factor in making sales under present competitive conditions." The forecast of business conditions for October, November and December for the New England paper and pulp industry indicates an increase of 5 to 10 per cent over the same period in 1927.

The first Boston meeting of the Paper Users Standardization Bureau will be held at the Statler Hotel, Boston, on Tuesday, October 30. It will be an all day conference, participated in by the five Boston service houses of the American Writing Paper Co., and presided over by Robert C. Fay, director of the Bureau.

Supply Men Abroad

Dean Wheatley, general manager of the International Purchasing Co., of Boston, purchasers of old rope for a large group of rope paper mills in this country, together with Robert Lennox purchasing agent of the Hollingsworth & Vose Co. of Boston, were the guests of a recent formal dinner tendered them in London by the British Paper Stock Ass'n.

Starch—

A SIMPLE change in the manufacturing process often results in a pronounced decrease in cost of production.

Paper Mills use Starch for sizing to produce better and stronger sheets with lower cost of manufacture.

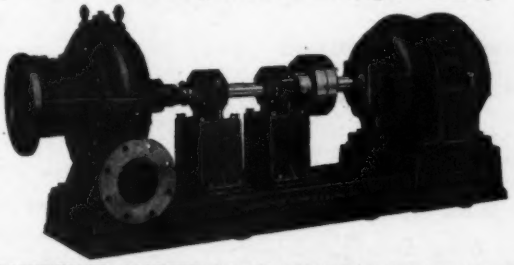
Our SPECIAL PAPER brand for beater-sizing increases strength of sheet and gives improved finish.

Our FOX HEAD brand for top-sizing is more economical than all glue-size.

CORN PRODUCTS REFINING COMPANY
17 Battery Place, New York City

LAWRENCE "VORTEX" CENTRIFUGAL PUMPS

—Built For Every Need in the Paper Industry



LAWRENCE "VORTEX" BALL BEARING STOCK PUMP
A STOCK PUMP THAT STAYS ON THE JOB

Designed by Engineers who have specialized in pulp and paper mill requirements. A STOCK PUMP that will absolutely deliver the "stuff" faster, continuously, and more efficiently, and will not clog.

Rugged construction throughout. Heavy shaft. Oversize heavy duty Ball Bearings guarantee long life with least attention.

Our Engineers are always ready to help you with pumping problems. Write for Bulletins.

Lawrence Pump & Engine Co.
P. O. BOX 70,
LAWRENCE, MASS.
N. Y. Office—90 West St.

Here's A System That Saves Money!

THIS Norwood three-unit filtration system is actually saving money for many mills. With this system water can be taken from your river or stream and perfectly filtered to remove pollution and foreign matter. ¶ Automatic chemical treatment removes color and objectionable chemical content. ¶ Maintenance and operating costs are so low as to be negligible, for one single hand wheel replaces the many complicated operating contraptions found on some filters.

¶ Norwood filters save money by improving the quality of paper and cutting down the proportion of "seconds". One unit can be washed while the other two continue in operation, and they can be depended upon for continuous, satisfactory and economical performance. ¶ Norwood's engineers will gladly help you to get a true picture of the advantages and economies of filtration for your plant. Catalogs and complete information gladly furnished on request. Ask us—NOW!

NORWOOD

Filters, Calenders, Platers, Rag Thrashers, Folding Machines and Roller Suction Boxes

Give Satisfaction

Norwood Engineering Co., Florence, Mass.

NORWOOD

The meeting was the occasion of a frank discussion of the specifications established by the International Purchasing Co., on old rope for papermaking. Much difficulty has been experienced because foreign packers have not been able to appreciate the serious reasons that impelled the buyers to insist on rigid adherence to these specifications. The quality of rope paper required in the electrical industry, each lot of it being subject to chemical analysis was fully explained, and the growing tendency of the shippers to include larger quantities of oily rope had to be combatted.

The International Purchasing Co. is said to be considering the establishment of a general packing plant in Holland or Belgium where old rope from all European countries can be sorted and packed according to American requirements. The Boston office is not aware that the company is definitely committed to such a plan.

Walter Simonds of the Train Smith Co., packers and importers of paper mill supplies, 333 Washington street, Boston, is at present on an extended European business trip.

The old stone mill in Waltham which has been used in the past for making paper board has been acquired by a new corporation recently chartered under Massachusetts laws and to be known as the Stony Brook Paper Co. Horace Z. Landon of the Industrial Tube Co., is one of the incorporators. High grade wrapping papers will be made according to the papers of incorporation.

Connecticut Valley Supers Hold Meeting

The Connecticut Valley Division of the American Pulp and Paper Mill Superintendents' Association held a well-attended meeting at the Hotel Nonotuck, Holyoke, Mass., on Saturday, September 29, members being present from distant mill centers as well as the local mills. William B. Clements, chairman, presided, calling the meeting to order after dinner had been served.

The first business taken up was a report of the convention chairman and treasurer, in connection with the annual meeting of the parent association in Pittsfield, Mass., last May. The report showed that the convention was one of the best ever held by the association, and the attendance the largest. After all expenses had been paid a balance remained which was voted to chairman John J. White for his services in managing the convention, which all present agreed was no small task.

Chairman White thanked the members, stated that he would accept the gift, and then he immediately made a present of it to the division for developing the activities of the local association. He read the names of contributors to the convention fund and gave unstinted praise to the manufacturers of Berkshire County for the aid they had given toward making the convention the success it was. It was recommended that a vote of thanks to these contributors be passed and that Mr. White should be authorized to communicate it to them.

After the passage of a rising vote of thanks to Charles M. Mooney, of Lee, and to "Brad" West, of Pittsfield, the division voted to make W. M. Crane, Jr., Dalton; George Rodney Wallace, Jr., Fitchburg, and "Brad" West, Pittsfield, honorary members of the division.

New Club Formed

One of the most progressive steps taken by the Connecticut Valley Division was represented by a resolution to form a club to be known as the Super-Craftsmen Club, membership in which will be open to all members of the Connecticut Valley Division of Superintendents and members of the Connecticut Valley Club of Printing House Craftsmen. Associate membership in the new Super-Craftsmen Club will be open to foremen, superintendents, salesmen and executives of allied industries, while the executive heads of all paper mills in the district will be made honorary members.

John J. White was appointed chairman of a committee to arrange for a meeting of the Connecticut Valley Division at the Hotel Nonotuck, Holyoke, on Saturday, November 24, at which a dinner and entertainment will be provided. The sub-

Felt Cleanliness

THE **Cleanliness** of your **Felts** is an important part of your paper making. Dirty felts give you trouble and greatly increase your cost by necessitating frequent shut-downs for felt changes and washing.

A **Felt Washer** which will clean the felt while it is running will greatly increase the efficiency of your plant. The Lansing Felt Washer will do that.

The **Felt** will be **kept soft.**

The **Life** of the **Felt** will be **Increased.**

The **Quality** of the **Sheet** will be **improved.**

Greater Production will result as the necessity of shutting down for felt washing will be practically eliminated.

The washing is done in nature's own way, with plain water.

Representative mills all over the country are now using this washer with satisfactory results.

May we tell you more about it?

GILBERT J. SCOFIELD COMPANY, INC.

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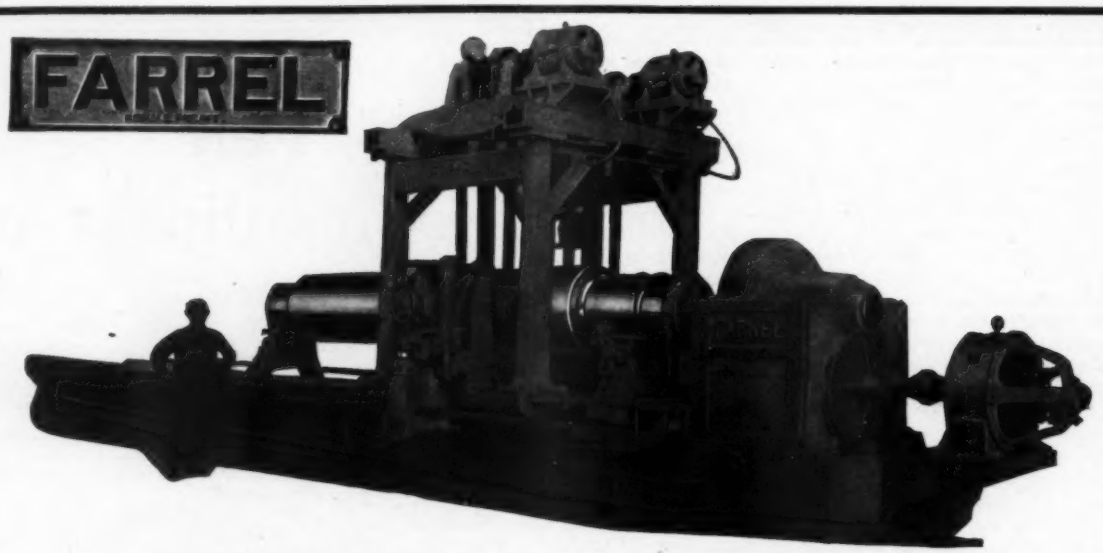
ALBANY, N. Y.



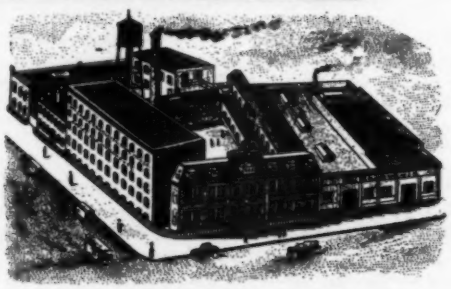
FARREL 36″ NEW TYPE ROLL GRINDER

The SWING REST PRINCIPLE is an EXCLUSIVE FEATURE on the FARREL GRINDERS, providing for GREATER ACCURACY than can be obtained on grinders without this feature. These machines are built in 24″, 32″, 36″ and 42″ sizes. Electrically driven throughout.

FARREL-BIRMINGHAM COMPANY INC.,
ANSONIA, CONN.

Successor to: Farrel Foundry & Machine Co., Ansonia, Conn., Est. 1848. Birmingham Iron Foundry, Derby, Conn., Est. 1836.

THE WM. CABBLE EXCELSIOR WIRE MANF'G CO.
MANUFACTURERS OF
SUPERIOR FOURDRINIER WIRES
Backing Wires
Cylinder Faces & Washer Wires
Red Brass Brush Wire



For 80 Years we have specialized in the manufacture of brass Fourdrinier Wires, Cylinder Covers, Washer Wires and Save-all Wires as well as Phosphor Bronze Fourdrinier Wires and Cylinder Covers.

Established 1848

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NEW YORK

ject for discussion at this meeting will be "The Problems of the Paper Ruler." This is a topic that has apparently never been discussed previously, and as it is planned to have a speaker on the subject who is an authority, the meeting should prove highly interesting.

Sues Paper Industries Association

A second suit which is being heard in the Federal District Court at Boston, involves the Paperboard Industries Association. The plaintiff is Wilbur Barrett, proprietor of the Barrett Paper Stock Co., of Haverhill, Mass., who previously sued the same organization in the State Courts of Massachusetts, where he was completely defeated on all counts. This case also involves alleged restraint of trade and is brought under the Sherman Anti Trust Law.

Barrett makes defendants, Bird & Son, Inc., of East Walpole, Mass., who are not members of the association, the Robert Gair Co., and the Chemical Paper Mfg. Co., who with the Association will jointly hire counsel in defense; Mr. Barrett in his allegations declares that the present Association is another name for the same organization that functioned as the Paperboard section of the Armstrong Bureau some years ago and which was dissolved after the decision of the Supreme Court in the American Linseed Oil Case.

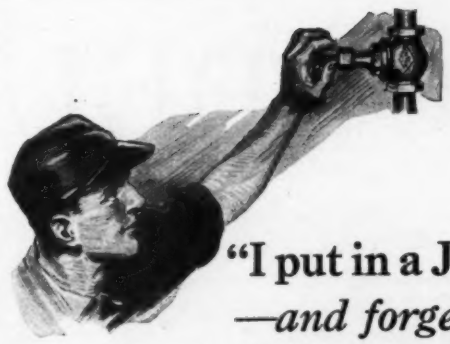
The plaintiff alleges efforts to restrain trade by dissemination of facts and figures regarding production, distribution stocks and prices paid through the association, and efforts leading to measures forcing the dealers to sell to whatever mill the members might specify. He also declared that by censure, threats, expulsion, etc., members are required to observe the rules of the association. Inasmuch as the Government has several times given its tacit approval to the measures of the Paper Board Industries Association, whose efforts have brought order out of chaos in an industry that was greatly overdeveloped, and with the record of the State Court in their favor, defendants have little to fear of the result of this suit, though they are following it closely.

Traffic News

Damage to rack cars has been protested by the Maine Central R. R., who have sought to adjust the matter amicably with the shippers who bring pulpwood through the port of Portland, Me. It appears that there is also some difficulty brewing on the matter of rates. A large portion of the imported wood is dry and in two foot length. When dropped from the unloading towers, it does no damage to equipment. The four foot logs of another paper company, however, are heavier by virtue of their length and also because they are wet, having been taken from Canadian river drives.

The rates of pulpwood are made in term of cords. A wet cord of wood, however, will weigh more than a dry one and due to the longer lengths will load lighter per car. The railroad has accepted an average per cord weight of 4,000 lbs., but the large wet logs are averaging well up to and over 5,000 pounds per cord. From any viewpoint, it means less revenue for hauling more weight to the carrier. At the same time, it is of no advantage to the paper company to whom the dry weight is the only useful part of the commodity. Tests are being conducted this season by the road and after the season closes which will occur by the end of October, some definite new data for a possible new basis of rates may be available. The change to a rate per 100 pounds in place of per cord is one possibility which would only be adopted after due consultation with shippers.

In Boston the big piece of traffic news of the current month was the hearing on coal freight rates at the Boston Chamber of Commerce. The Boston & Maine R. R. has proposed a new basis of coal tariffs to all its stations from tidewater ports and the other New England carriers adjusted their tariffs temporarily to conform to the B. & M. scale. The latter is based on a rate of $1.30 per ton for a 30-mile block. The carrier arrived at this basis by taking its $1.32 rate to Lawrence and Lowell, where one-third of its tidewater shipments move, and reducing it 2. The present rate system is chaotic. There are seven different rates for a fifteen mile block. Despite the fact that the net result of the pro-



"I put in a Jenkins —and forget it"

Engineers have found they can place full confidence in a Jenkins Valve. They know they can install it and forget about it—that it is a sure bet for long trouble-free service.

The paper industry in particular is a large user of Jenkins Valves. On beaters and bleach boilers, in the handling of thick, heavy pulps, and in the less specialized services in the power plant, experience has shown that it pays to install a good valve first.

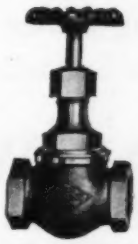


Fig. 106

Screwed, Jenkins Standard Bronze Globe Valve

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524 Atlantic Avenue.....Boston, Mass.
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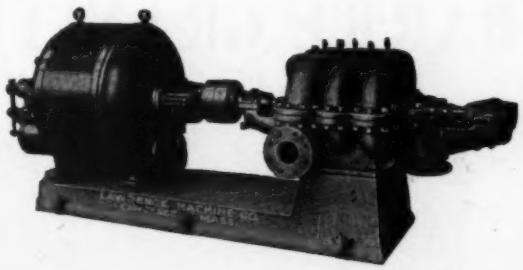

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Our many years of experience designing and building pumps backed up by unlimited capital and modern facilities places us in the front rank as pump builders.

Some of our competitors try to imitate, but none can equal.

Write the Lawrence Machine Co., for complete details and prices. Free engineering service.

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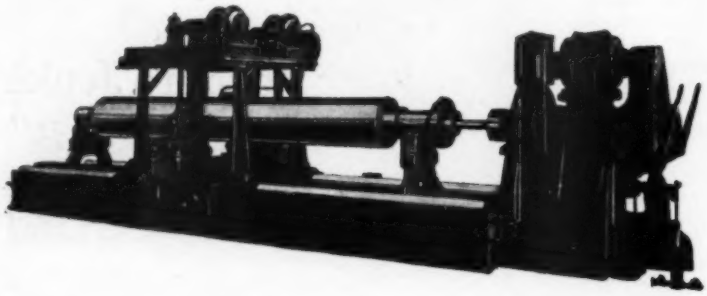
LAWRENCE, MASS.

Manufacturer of "Lawrence" Pump, Centrifugal Pumping Machinery, Vertical Steam Engines, Contractors for Special Machinery

LOBDELL

IMPROVED ROLL GRINDING MACHINE



A new model with enclosed geared driving head and full automatic lubrication including the Vs. and the feed-screw.

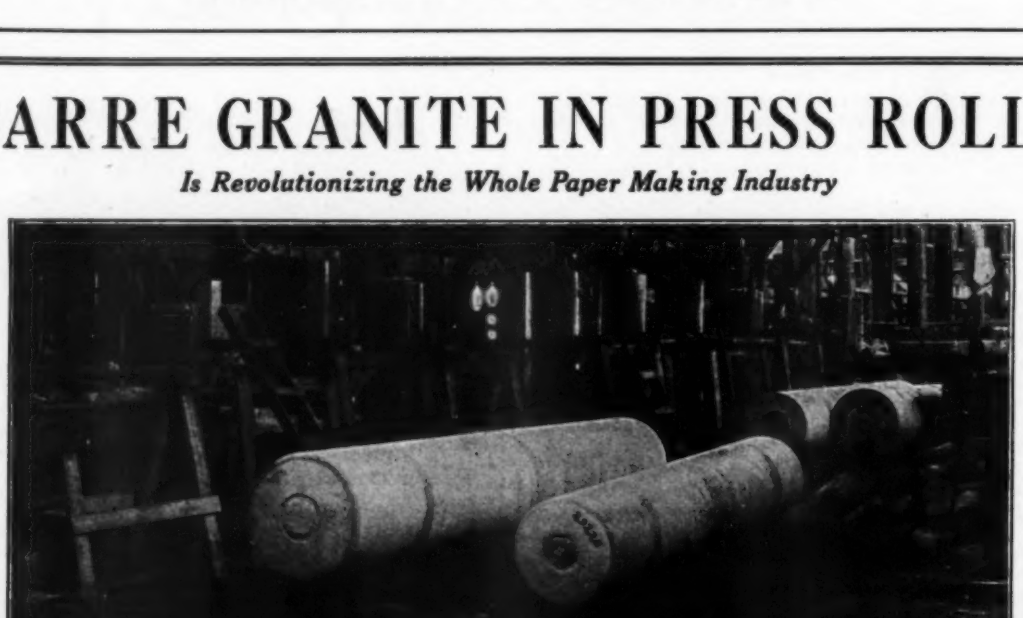
RAPID
ACCURATE
LONG-LIVED

The automatic crowning device and the provision for leveling the bed are exclusive features of the Lobdell Roll Grinders.

LOBDELL CAR WHEEL COMPANY
Established 1836
WILMINGTON, DELAWARE

BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry



If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. BOSTON, MASS.

posals is a slight decrease in revenue to the carriers, consumers are not satisfied. The New England Paper & Pulp Traffic Ass'n through its counsel, F. Manely Ives, and traffic manager, C. L. Whittemore, presented scores of exhibits to fortify its contention that present coal rates are too high. The Associated Industries of Massachusetts representing a score of industries, including a number of paper companies, protested the new scale and especially the rates from Providence and sound ports. Hearings are being held before I. C. C. Examiner Paul Carter. Proposed rates are suspended to December.

The New England Freight Association proposes to establish a rate of 30.50c per 100 pounds on woodpile from New York harbor lighterage points to Mechanics Falls, Me.

The New England Freight Ass'n proposes to establish a rate of 18c per hundred pounds on waste paper from Worcester to Holyoke, Mass. The proposed rate includes switching of $3.60 per car at Worcester. The same Association proposes a rate of 28.50c per 100 pounds on waste paper minimum carload from Boston, Mass., to Watertown and Carthage, N. Y., via the New Haven, Boston & Albany and N. Y. C.

Charles A. Tift, superintendent of the Chemical Paper Mfg. Co., of Holyoke, has resigned to accept a position with the Wyoming Paper Mfg. Co., at Northumberland, N. H. The latter company is equipped with two machines.

A paper storage building is to be constructed for the Angier Corporation at Framingham, Mass.; Monks & Johnson of Boston are the architects.

The mass of business forms received by the Paper Users Standardization Bureau for analysis and standardization has amounted to as much as 5,000 forms per day. More than 500 large organizations have had their paper standardized. Cheap papers used for record purposes and high grade rag papers used for temporary forms have been some of the glaring inconsistencies in the useage disclosed by this service. In fact, the use of the more expensive paper for the transient purpose was the more common error than the use of cheap paper for record purposes. Branch offices have been established throughout the country. The Bureau as a department of the American Writing Paper Co., does not mix sales with this service. The service was established because the average business man does not understand paper. When the Bureau has made its analysis it withdraws.

Ingleton Schenck, for the past nine years superintendent of the Madison mill of the Great Northern Paper Co., has resigned his position. Mr. Schenck has carried out many of his own ideas in the development of the Madison mill. He first came to Madison 20 years ago and has at times served at the Millinocket plant. He is moving to California where he will make his home.

Whiting's No. 3 Mill Completed

The Whiting Paper Company, Holyoke, has just placed in operation mill No. 3, its latest acquisition, which was formerly the Lyman textile mills. The plant has been reconditioned and equipped with new machinery for papermaking, and it is understood this mill will be used principally for the production of a fine new writing paper which will soon be put on the market. The new line, like most of the paper already produced in these mills, will carry a high percentage of rag.

The entire structure of this plant has been reinforced with structural steel, and the two lower floors combined and arranged to accommodate twin papermaking machines built by Rice, Barton & Fales. These machines are the largest to be installed in any of the Whiting mills. The upper stories of the plant have been equipped with special processing machinery.

Joseph C. Murphy has been transferred from the company's No. 2 mill at Wilbraham, as superintendent of the new No. 3 mill. This new unit has required the addition of 350 employees to the Whiting force.

RHOADS TANNATE WATERSHED LEATHER BELTING

TANNATE SAVES $40—PER-HOUR STOPS

"YOU don't have to praise your Tannate Belt to me any more", replied a Wisconsin paper mill superintendent to a Rhoads representative in 1926. He then added, "As you may see from your records we have invested about $5,000 in Tannate to date. (Bought their first Tannate Belt, Oct. 1924.) As far as lasting qualities are concerned some of them have already paid for themselves. *But here is something that has impressed me.* We are keeping an exact record of shut-downs and the causes. During 1923 when we did not have a Tannate Belt in the place, we were using rubber and some oak belts, our shut downs on account of belt-troubles amounted to 60 hours. During the past six months when *all cone and Pump drives are Tannate* we have not lost five minutes on account of belt troubles. It costs us about $40 per hour when we have to shut down."

That was said two years ago. In the meantime they have added $1500 more to their Tannate equipment, covering 22 belts and only three of these are for replacement of Tannate Belts.

$5,000 during a fifteen months period as rubber and oak belts needed replacement; $1500 during the succeeding two year period!

Such a showing can only mean lower belt cost and lower up-keep and greater output which means more economical production costs.

May we help you in the same way, under the Rhoads broad SERVICE GUARANTEE?

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Again PACEMAKER scores

"PACEMAKER BELTS ARE GIVING BETTER SATISFACTION PER DOLLAR INVESTED"—That is what the Interstate Drop Forge Co., Milwaukee, Wisconsin, says after trying various types of belting. And, that's the reason you'll find Pacemaker serving in every branch of industry.

A test of Pacemaker Belting will convince you that it is a most economical link between power and production.

Here is one of the hard drives in the plant of the Interstate Drop Forge Co. Two 10-in. x 6 ply Heavy Pacemaker belts handle this 2500 lb. drop forge hammer.

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The recent installation of a Sykes Type continuous tooth Herringbone Gear generating machine enables us to include this type of gearing in our complete line.

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Gears for Every Industrial Purpose—Worm—Bevel—Herringbone—Spur—Spiral—Hardened Heat Treated Gears —Non-Metallic Gears and Pinions

PACIFIC COAST NEWS

OREGON

Sitka Spruce Pulp and Paper Co. Organized

A 50-ton sulphite mill to produce pulp for the manufacture of bond and other high grade paper will be erected near Marshfield, Ore., construction to start immediately, according to an announcement made late in September by C. McC. Johnson, prominent lumberman of Southwestern Oregon and a resident of Marshfield. The plant is to be located one mile south of Empire and will occupy a 40-acre site with a quarter mile water front.

The Sitka Spruce Pulp and Paper Co. is the name of the concern which has a capital stock of $1,000,000. The buildings will consist of a 70-foot acid tower, steel digester tank housed in a building 30x60 feet and 100 feet high as well as two other buildings 50x150 feet. About 150 men will be employed at the mill. Tracts of timber have been placed under option by the organization with the view to purchasing them and hemlock and spruce are to be purchased on the open market. The possibility building of a railroad spur to the mill from the Southern Pacific line where it crosses Coos Bay is very likely.

All financial arrangements have been made, and while no other names were disclosed, it is believed that Nonda Anderson who has been actively associated with Mr. Johnson at Reedsport, will take an active part in the Sitka Spruce Pulp and Paper Co.

New Board Mill for Portland

The Federal Paper and Board mill is the name of a new industry which is to be established in Portland, Ore. within the next few months. The new firm will manufacture paper and paper board from waste paper, using a new process which they have developed. Max E. Goldberg is president of the company and his brother Isadore Goldberg is secretary. The company has been incorporated with 5000 shares of no par value.

A site is being selected for the mill which will have a capacity of 40 tons daily but up to the time of writing no definite decision as to a location had been reached. However, Mr. Goldberg stated that they had a plot of ground under consideration. If plans are realized, they hope to get started on construction before the first of the year. Mr. Goldberg and his brother have been doing business in Portland for several years, operating a bag company under the name of Goldberg Brothers Corporation with yards at Front and Yamhill streets and Front and Mill streets.

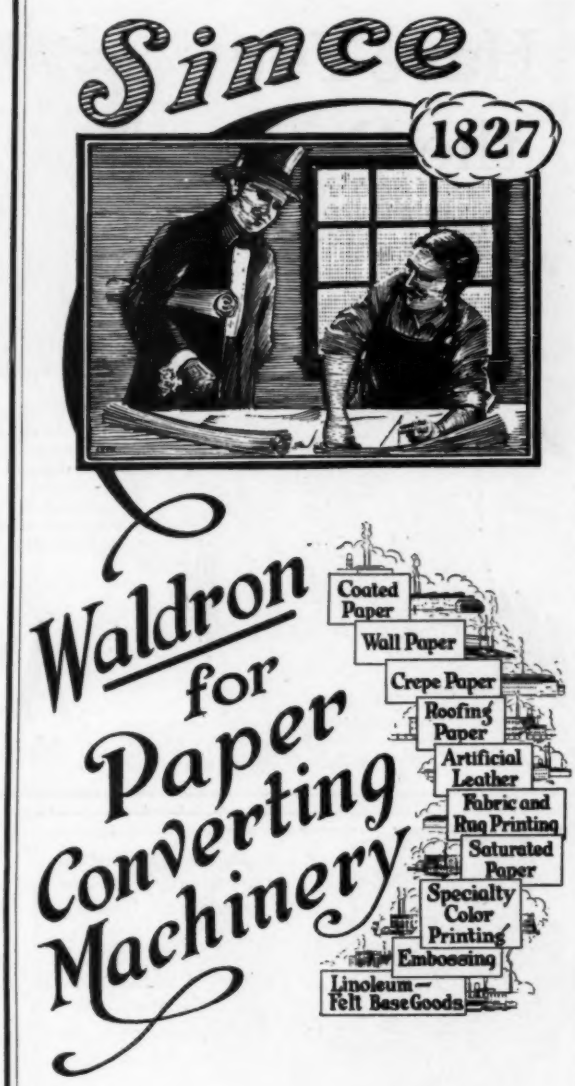
Employees of the Crown Willamette Paper Co. at Oregon City, Ore., recently tendered John H. Walker, head of the land and tax department, a surprise banquet celebrating the double anniversary of his marriage forty-two years ago and the beginning of his service with the company forty years ago. Mr. Walker started as timber superintendent and brought the first logs used by the mill in making paper at Oregon City. Several fine tokens in appreciation of his service and in honor of the occasion.

WASHINGTON

West May Have Pulp and Paper Ass'n

A meeting has been called for October 26 at the University of Washington in Seattle, for the purpose of bringing together technical men and executives in the pulp and paper industry on the Pacific Coast. At this meeting the possibility of forming a permanent organization similar to those in the East will be considered, a number of addresses will be made and discussions held on subjects of interest to members of the industry.

It is felt that the meeting will be of benefit to the University of Washington since it maintains a department which



For more than one hundred years, Waldron has worked with these industries—supplying valuable data, furnishing specific information, making proper recommendations concerning processing methods and machinery to improve products. No other organization is so well equipped with experience and knowledge to assist in solving your problems. If it is for paper converting—consult Waldron.

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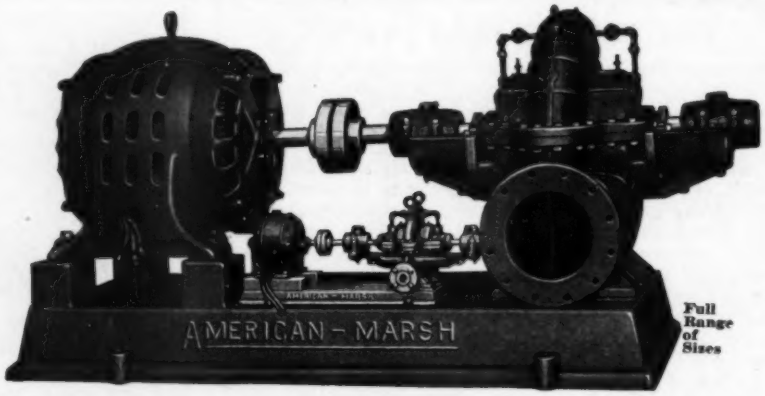
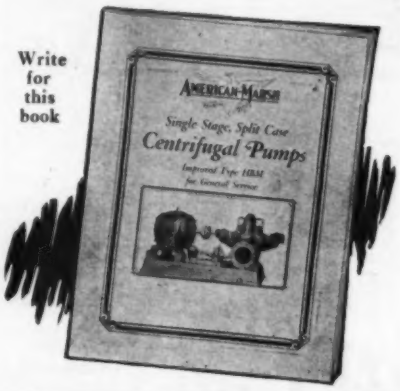


Full Range of Sizes

Write for this book

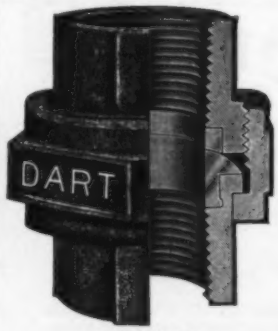


THERE'S a genuine story of achievement back of these new American-Marsh HBM Single Stage, Split Case Centrifugals—higher efficiencies—end thrust eliminated—impellers hydraulically balanced—conservative ratings obtained in service as well as on the test block—heavy duty construction throughout. Use HBM Pumps for water supply, boiler feed, pressure boosting—general mill service. Use them to cut operating cost; to reduce maintenance. Ask for Bulletin 38, or for the cooperation of American-Marsh engineers.

AMERICAN STEAM PUMP COMPANY
BATTLE CREEK, MICHIGAN, U. S. A.

AMERICAN-MARSH

New **HBM Centrifugal Pumps**



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Strength of Malleable Iron in combination with

2 Two Non corrosive seats of bronze

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STEEL PLATE CONSTRUCTION
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Specialists in PAPER DIGESTERS and Heavy Plate Work
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"TWENTY TIMES FASTER THAN BY HAND"

For lifting paper rolls, removing calender rolls or raising Fourdrinier wires, use ROEPER Type "R" Electric Hoists—With or without Trolleys—Speeds up to 40 feet per minute—Send for Bulletins.

ROEPER CRANE & HOIST WORKS, Inc.
1724 North 10th Street READING, PA.
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THE JOHNSON FRICTION CLUTCH
For Printing Machinery
Write for Catalog, P. I.
THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

is training men to enter the industry, and, at the same time, university officials believe that the pulp and paper men will profit from this contact with the university.

It is planned to devote the morning session to talks from members of co-operating industries and the afternoon to subjects and discussions of interest to technical men. Some of the subjects are: "Reforestation as a Source of Pulp wood"; "Taxation in Relation to Reforestation"; "Logging Waste"; "Sawmill Waste"; "Some Experimental results in Cooking Douglas Fir with Sulphite Acid".

A dinner will be held in the evening, after which short addresses will be made on subjects of interest to members of the pulp and paper industry.

An executive committee, appointed by President M. L. Spencer of the University of Washington, has been placed in charge of the affair and includes: H. K. Benson, professor of chemical engineering at the University of Washington, chairman; Dean Vernon MacKenzie, school of journalism, University of Washington; A. H. B. Jordan of the Everett Pulp and Paper Company, Everett, Washington; O. C. Schoenwerk, Washington Pulp and Paper Corporation and affiliated companies.

Bagley & Sewall Gets Order from Grays Harbor

The Bagley and Sewall Co. of Watertown, N. Y., has received an order for the construction of a new 202 inch paper machine for the Grays Harbor Pulp and Paper Co., of Hoquaim, Wash. The Grays Harbor Pulp and Paper Co., has been incorporated to include the Grays Harbor Pulp Co., a subsidiary of the Zellerbach Corp., which has just completed a new pulp mill, and will also control the new paper mill to be erected by the Zellerbach interests and the Hammermill Paper Co. adjacent to the pulp mill.

This machine will be used for the manufacture of sulphite bond paper and it is reported will be capable of producing 1,000 feet of paper a minute, making it perhaps the fastest machine built for the exclusive manufacture of high grade paper.

The Bagley and Sewall Co. is also constructing a 240 inch kraft paper machine for the Port Townsend, Wash. mill of the Crown Zellerbach Paper Co.

William E. Eibel, general manager of the Rhinelander Paper Co., Rhinelander, Wis., returned to the East early in September after a three weeks' tour of the Pacific Coast in the interests of establishing a $2,000,000 pulp and paper mill. No announcement was made by him prior to his departure as to where such a mill would be established, but Seattle was one of the cities considered as a possible location. $2,000,000 in Eastern capital is available for this pulp and paper mill and the actual decision will probably be announced soon as building would be started within six months if the plans are realized. A. E. Millington, vice-president and general manager of the Fir-Tex Insulating Co. of Portland accompanied Mr. Eibel to Seattle.

CALIFORNIA

Crown-Zellerbach Stockholders Meet

At a stockholders meeting held recently by the Crown-Zellerbach Co. at San Francisco, officers, were elected and members of the executive committee and directors were named. Isadore Zellerbach was named president of the company and Louis Bloch chairman of the board of directors. M. R. Higgins was given the position of chairman of the executive committee.

The following were made executive vice-presidents: E. M. Mills, A. B. Martin, J. D. Zellerbach, and H. L. Zellerbach. D. J. Goldsmith was elected vice-president; A. Von der Zwiep, assistant secretary; S. Sonnenberg, treasurer. In addition to chairman Higgins, the executive committee includes the following: L. Bloch, A. B. Martin, E. M. Mills, I. Zellerbach and J. D. Zellerbach. Other directors include: H. C. Olcott, J. Y. Baruh, Charles R. Blyth, M. M. Baruh, James H. Schwabacher, George S. Towne, Herbert Fleishhacker. All of these men are either prominent in the pulp and paper industry or in the financial world.

POWELL VALVES

Fig. 507 Non-Rising Stem Gate Valve

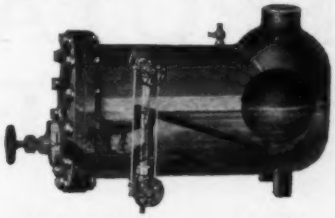
POWELL 125 Pound Gate Valves are designed for standard pressure with full straight-way openings offering very little if any impedence to flow through body of valve. They are obtainable with screw or flanged ends, with rising or non-rising stems. The wedge discs are accurately guided by lugs cast integral which travel in grooves cast in body.

Reinforcing ribs cast in the body and additional thickness in the hexagon ends assure strength, safety and relief from undue strains created through expansion or contraction and weight of piping. These valves can be repacked under pressure with the valve full open. Sizes ¼ to 3 inches.

Powell Valves are distributed everywhere

THE WM. POWELL CO.
2525 Spring Grove Ave., Cincinnati, Ohio

For greater capacity



Davis Steam Traps

THE duplex valves and continuous flow give this Davis Steam Trap the unusually large reserve capacity that has won its wide application for draining dry kiln coils, steam and oil separators, cooking kettles and wherever there is a big volume of condensate but subject to great variation.

TWO balanced float valves, frictionless in operation, facilitate and automatically regulate the flow. The water level never drops below the valve openings—steam can never escape. Catalog showing details of construction and design will tell you why so many plant engineers are specifying Davis Valve Specialties.

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Automatic valve makers for over fifty years

DAVIS VALVE SPECIALTIES

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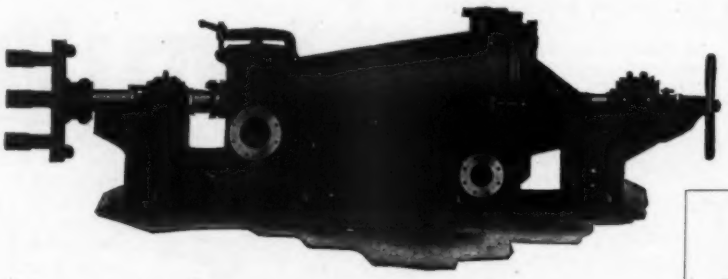

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Longer Life—
Power Economy—
Timken Tapered Roller Bearings—
Quick Seal-Breakers—
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A Permanent Jordan Installation Is Best

THE Hercules Jordan Engine, designed for Timken Tapered Roller Bearings, eliminates practically every point of destructive wear. Our Jordans, once installed, will deliver efficient service over a vastly longer period of time. There is a substantial saving in power. Fillings and Linings changed less frequently and with an economy of time and labor.

Engineering Data Mailed Upon Request.

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QUALITY

Are the Three PRINCIPAL Factors Which Have Placed

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We could comment about technical manufacturing operations, stating WHY—LOCKPORT TENAX FELTS excel all others, but, without a practical demonstration it would not mean a thing to the PAPERMAKER. Results—Count.

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SERVICE—*Which means attention in every detail*
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LOCKPORT FELT CO.

NEWFANE, NEW YORK

BRITISH CORRESPONDENCE

Papermaking Industry Quiet

Little change has taken place in the conditions of the paper industry this month. The newsprint manufacturers are having considerable competition to face, and are experiencing difficulty in keeping up the pace set by colonial and foreign manufacturers. Home consumption continues to increase, and while the home mills are supplying a proportion of this, much more is being obtained from Canadian and Newfoundland mills.

Most mills are quiet in the woodfree section, and special terms are being offered by the continental manufacturers. British price levels are firm, lower than a year ago, and it is not anticipated that they will change during the rest of the year. The British mills have the advantage in that their quality is known to be better, and they are able to guarantee prompter delivery that the firms selling imported makes.

Difficulties have been created for the esparto mills by an excess production of esparto papers in both the writing and printing classes. Increased output has been made possible by new plants, and this has affected new prices for available business. No increase is recorded in the consumption of esparto papers, and no progress has been made in developing foreign and colonial markets for the sale of this class of paper. Some of the makers are looking for new outlets overseas, or new fields of consumption at home, for there seems little possibility of increased consumption in commercial or educational circles.

In the fine writing section, the bulk of the business is going to the larger mills; but a better general demand is anticipated at the beginning of next month when the holiday season will have expired, and the business world getting into its stride again. Several of the larger concerns have meanwhile been carrying out reorganizations in several directions.

Several important changes have taken place recently in the methods of paper distribution in this country. Several merchandising concerns have been acquired by a papermaking house, creating fresh problems for some of the smaller mills. Leaders in the trade, however, express the opinion that the movements now in progress may lead to a simplified industry, in which great economies can be made, and much waste of energy and capital avoided.

Exports in fine papers are improving, and several of the overseas markets have never been better exploited. In Australia, there has always been a preference shown for English fine papers, while South America is beginning to show a keen appreciation of their qualities, and is using our writing papers in much larger quantities; while from the United States there are inquiries for rag papers of special quality.

In the wrapping section, every mill is busy at the present time with the production of kraft wrappings, sulphites, machine glazed papers, and specialities. The holiday season does not affect this section of the industry so adversely as it does practically all other branches; indeed this year, the holiday periods seems to have provided an accelerating influence, for the season now concluding has brought considerable new business to the makers of wrapping papers.

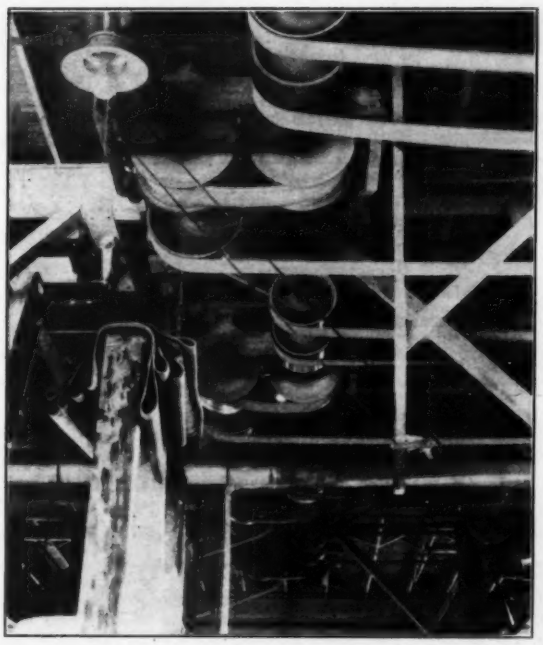
A mild boom has been experienced in Scandinavia whose exports to this country are still considerable, although inevitably adversely affected by the imposition of the tariff. Some idea of its effect may be gathered from the fact that in July of this year the imports of wrapping paper were 306,100 cwt. against 379,622 cwt. for July of 1926.

With continually new uses for kraft wrappings being exploited, it is no matter for surprise that the consumption continues to improve. Extended uses are also being found for grease-proofs and sulphites, as well as machine glazed papers.

Harry A. Brody, formerly manager of the New York City office of A. C. Loveland & Co., of Hartford, Conn., has entered business for himself under his own name dealing in paper mill supplies, with offices at 200 Fifth avenue, New York.

LEWELLEN Variable Speed TRANSMISSION

One conclusion is inevitable, from a study of the problems of the paper industry. Obsolete equipment must be eliminated, if the paper manufacturer is to make a profit. The LEWELLEN Variable Speed Transmission is an important factor in the up-to-date paper mill. Winders, carriers, cutters, presses, calenders, etc., are most efficient when equipped with the LEWELLEN Transmission.



At the Midwest Wall Paper Co., Joliet, Ill., Five LEWELLEN Variable Speed Transmissions, operating wall paper printing machines, Rewinders, from these printing machines, also are controlled by LEWELLEN Transmissions, not shown in this picture.

The LEWELLEN Manufacturing Co. is keeping pace with progress in the paper industry. Several very important improvements have been developed and adopted since our last catalog was issued. These are fully described in our bulletin No. 275, just issued. If you have not received this bulletin, a line from you will bring it by return mail.

Lewellen Manufacturing Co.
COLUMBUS, INDIANA

Are you familiar with the merit of the HARVEY-LEWELLEN Paper Thickness Control? We shall be glad to tell you about this HARVEY-LEWELLEN system.

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112" three-cylinder Pulp Machine. Six sets presses; 83 dryers, 48"x 108"; reel; re-winder; drives; counter shafts; shower pipes, etc. All complete. Reasonable price. Immediate delivery.

48—36"x84" Dryers, complete with double deck frames, gears, syphons, steam connections and everything. In A-1 condition, and for immediate delivery. Price reasonable.

Two Noble & Wood Mammoth Jordan Junior Engines, complete and in good condition.

One Ball Bearing Claflin Engine.

One 74" Seybold Holyoke Paper Cutter.

One 42" and one 62" Cameron Slitter and Rewinder.

Three Calender Stacks suitable for board—one seven and one nine roll, 116" face; one 13 roll 131" face.

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1— 84" Clark Cutter with Moore & White Layboy
2— 90" Holyoke Super Calenders motor drive
1— 72" Holyoke Super Calender motor drive
3— 66" Holyoke Super Calenders belt drive
1—154" Warren two drum winder with slitter
1—149" Beloit two drum winder with slitter
1—130" Moore & White four drum winder with slitter
1—129" Pusey & Jones two drum winder with slitter
1—127" Warren two drum winder with slitter
1—112" Moore & White four drum winder with slitter
1— 84" Beloit two drum winder with slitter
1— 60" Kidder two drum winder with slitter
1— 77", 60", 52" Hamblet Sheet Cutters.
1— 70", 56", 54" Moore & White Sheet Cutters
1— 14x16" Ball Twin Variable Speed Engine

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USED JORDANS—7-Large Jordans, some belt drive and some direct connected to motors, including motors and starters, all in good condition and at extremely low prices. If interested, write us quickly, describing your requirements. The Noble & Wood Machine Co., Hoosick Falls, N. Y.

SUPERINTENDENT—20 years experience on Rag and Wood papers, wishes new connections with paper mill. Address Box 144, The Paper Industry.

WANTED—Mechanical design draftsman for machine design on paper and pulp mill machinery and equipment. Permanent position for an experienced man. Give full particulars about yourself and salary in first letter. Address Box 142, The Paper Industry.

FOR SALE—One slightly used Noble & Wood Mammoth Jordan together with 500 HP motor and coupling. It is also equipped with pulley for belt drive, if preferred. Price and particulars upon request. The Noble & Wood Machine Co., Hoosick Falls, N. Y.

WANTED—Position as Production Manager or Superintendent on cylinder machine, or news, Kraft and 9-point straw on Fourdrinier machine, also ground wood and sulphate pulp. Forty-four years old, 28 years experience. Have assisted in building several new mills and revamping old ones to increase quantity and quality. Have technical education and accustomed to modern equipment and methods. Address Box 145, The Paper Industry.

MICHIGAN NEWS

Sutherland Paper News

Installation of the new board machine at the Standard division of the Sutherland Paper Company, Kalamazoo, will be completed in four weeks, according to L. W. Sutherland, president. It will be a fine piece of equipment of its type and capable of turning out a large quantity of high grade board.

Since the consolidation of the Sutherland and Standard mills, the main offices have been located at the former plant in Lincoln avenue, while the mill operating and purchasing departments are in the former Standard offices.

B. C. Dickinson, former president of the Standard Company, is now treasurer of the Sutherland Paper Company, succeeding Walter L. Otis. Four additions are announced to the Sutherland directorate. They are B. C. Dickinson, James H. Dewing, W. J. Lawrence, all of Kalamazoo, and Jerome Keane of Detroit.

President Sutherland reports business is very active with his concern and production is maintained at a high standard.

The company is enlarging the capacity of its carton plant at the Standard division. Two high speed, two-color Babcock presses are being installed and a four color press also has been ordered. The entire interior of this carton plant is being repainted a cream white.

Fire of undetermined origin broke out in the warehouse of the Standard mill September 6th. Little damage resulted from fire, but a considerable part of the stock was water-soaked.

Harry Beach and family have left Kalamazoo to reside in Lime Rock, Conn., where Mr. Beach will take over the sales management of the Dard Hunter paper mill, which is owned in common by the Beach and Hunter families. This mill is the only concern of its kind in America, being devoted to the manufacture of hand-made paper exclusively and will go into production in the near future.

The Cost and Technical Association of the Paper Industry met September 20th at the home of Harold Dewey, Vicksburg, as the guest of the Lee Paper Co. Howard Bowman, Bryant Paper Co., read a paper on "Use of Time Study in the Coating Mill." James Forsythe of the Forsythe Paper Co., Chicago, spoke on "Customers Kicks and How to Meet Them." C. E. Manigold, Vicksburg, gave one of his interesting demonstrations of lightning calculating.

The new storage addition to the Eddy Paper Corporation plant has been completed. This building gives the plant an increased storage capacity of 2500 tons.

C. H. Chapman, formerly sales engineer of the Paper Mills Supply Co., of Kalamazoo, Mich., is now with Price & Pierce, Ltd., pulp and paper mill agents of 17 E. 42nd St., New York.

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Consistency Regulators.
Metering Systems.
Float Valves.
Stock Meters.
Rotary Pulp Screens.

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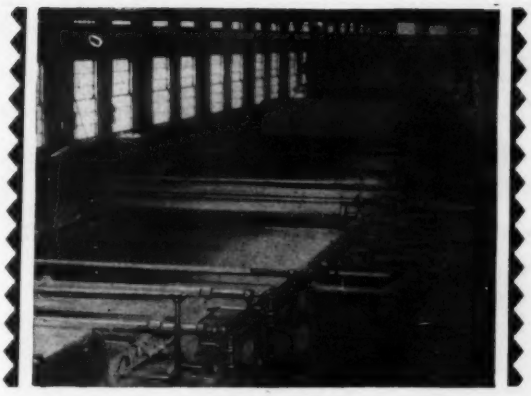

Production hangs by a thread!

THE production of a Fourdrinier machine literally hangs by a fine thread of wire.

Only wire of the highest durability will assure dependable, production schedules.

Wire of sufficient strength and toughness requires special composition metal, expert drawing to size, special annealing and constant watchfulness against the slightest irregularity or weakness.

Tyler quality and the Tyler process of manufacture assure wires that run straight and true, that will not mark or cut the paper, that will not cause feathery edges or other defects.

Paper makers who want a maximum production from their Fourdrinier machines, specify Tyler Fourdrinier Wires.

Supplied in all widths up to and including 234 inches

The W. S. TYLER COMPANY
Cleveland, O.

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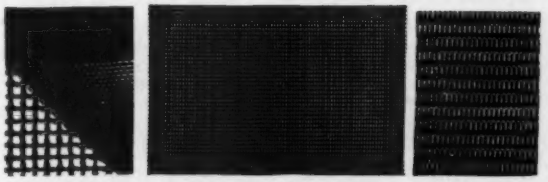

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Records of Veteran Papermakers Wanted

A reference in a recent issue of THE PAPER INDUSTRY to the oldest living man in sulphite pulp manufacture in Sweden has started an inquiry to determine who holds the record in the United States for length of service in paper mill work. In this connection, information reaches us that Michael H. Ward, a beater engineer at the plant of the Mosinee Paper Mills Company, Mosinee, Wis., is just retiring from active work at the age of 82, after having completed a constant service in paper mills since 1861.

It would be interesting to know if there are any older papermakers in this country, as we are of opinion that Mr. Ward's record of service, extending over sixty-seven years, is unique. If any of our readers can give particulars of other veterans in the industry we shall be glad to hear from them.

Walter H. Martens, associate manager of the mill supply department of George W. Millar & Co., Inc., paper dealers and suppliers of raw materials to paper mills of 284 Lafayette St., New York, returned on October 1 from a several months' business trip to Europe.

The Long Island Paper and Twine Co., Inc., is the name of a new paper and twine jobbing concern just incorporated under New York State laws with a capital of 50 shares of common stock of no par value, and will be located in Babylon, L. I. Edwin R. Lynde, George A. Logan and William P. Scully, of 16 Court St., Brooklyn, N. Y., were the incorporators.

F. Palangio, well known dealer in paper stock in Jersey City, N. J., and W. D. Quigley, formerly purchasing agent of the Continental Paper Co., of Bogota, N. J., manufacturer of ... boards, have embarked in business under the firm name of Quigley & Co. to deal in paper mill supplies, with offices and warehouse at 200 Merseles St., Jersey City.

A petition in bankruptcy was filed on September 20 against the Crotona Paper and Twine Corp., of 4008 Third Ave., New York, by a group of creditors on claims aggregating $775. The firm is a retail distributor of paper and twine.

New Catalogues, Books and Publications

American Manganese Steel Co., 333 N. Michigan Ave., Chicago—A pocket size brochure entitled "The Manganese Steel", thoroughly describes Amsco Manganese steel as to its history, advantages and application, dwelling mostly on facts and giving buyers a short, interesting summary for quick interpretation. Copies on request.

Englehard, Inc., Charles, Newark, N. J.—A new bulletin has recently been issued describing the Engelhard SO_2 Analyzer and its use for analyzing SO_2 by the thermal conductivity method. A table is shown regarding the relative advantages of this method of analysis compared with other methods. Copies on request.

Foster Wheeler Corp., New York City—A new superheater catalogue, No. 304, consists largely of illustrations of superheater installation, also short statements covering the history of Foster superheaters and their application to many types of boilers, including longitudinal drum, cross drum, bent tube and return tubular. There is also a steam table extending up to 1500 lb. absolute pressure and 300 degrees superheat.

W. A. Jones Foundry & Machine Co., Chicago—Announcement is made in catalogue No. 37 of this company's new semi-steel pulley. This pulley is a solid cast unit, a combination of steel and iron, and is offered at no increase in cost over the old type cast iron steel pulley. Complete description and cuts are included, also tables of dimensions and prices.

Reliance Electric & Engineering Co., Cleveland, Ohio—Type AA Reliance Fully-Enclosed Fan-Cooled Induction Motors is the subject of a new bulletin No. 103. There is a complete description well illustrated of the skeleton frame motor with the exhaust type fan, which is a new product.

Revolvator Co., Jersey City, N. J.—Bulletin 82A describes and illustrates the new revolvable base for portable elevators, and No. 83B shows the construction of this company's enclosed gears and splash system lubrication, which has been designed for the purpose of making operation of its machinery safe.

Whiting Corporation, Harvey, Ill.—Article No. III of this company's series on Heat Transfer and Crystallization, by W. L. Badger has just been issued. This article takes up the study of evaporator types, and will be mailed on request.

Walter A. Zeinicker Supply Co., St. Louis, Mo.—Bulletin No. 375 contains 24 pages of bargains in new and used rails, sheet steel piling, railroad equipment, oil engines, heavy machinery, contractor's equipment. Copy will be sent on request.

Efficiency measures power economy

Efficiency and dependability must be considered when figuring lowest cost power drive equipment, for no equipment is better than the service it gives.

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Hill Clutch power equipment for all industries is designed and built on the most advanced engineering principles, proven by practical tests to provide the most economical and efficient distribution of power in every phase.

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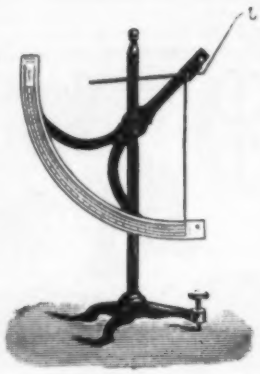
World Standard Paper Testers



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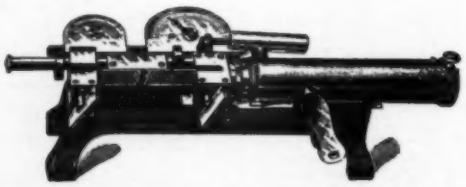
Carried in stock—1/1000 of an inch for Boards, 1/2000 of an inch for Paper.

Schopper Folding Tester
The folding test has become standard for bonds, ledgers, and Kraft papers.

Schopper Strength and Stretch Tester

Small Piece Pocket Paper Scale
By weighing a piece 2 in. by 4 in., gives basis weight 25x38, 24x36, 22x34, 500 sheets.



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Technical Developments in the Paper Industry

Domestic and Foreign

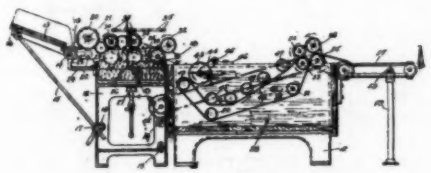
The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Making Pulp by Treatment with Alkali

SUITABLE cellulosic materials are treated with an alkali solution which contains as much as four per cent of the alkali at a maximum. The mixture of the cellulose and the alkali liquor is heated up to a temperature which corresponds to a vapor pressure of from seven to ten atmospheres. This temperature is, however, preferably maintained at a point that corresponds to a pressure of ten atmospheres. The duration of the treatment is from one half an hour to one hour. D. D. Nanji, Birmingham, England. United States Patent No. 1,679,441.

Gloss Coating Paper

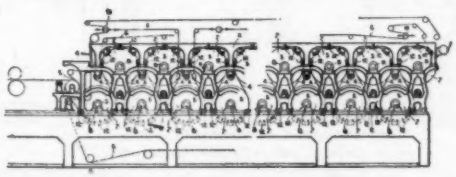
THE apparatus which is shown in the accompanying illustration is used in the manufacture of a moisture-free paper. The process consists in flooding the paper with an



indeterminate quantity of melted wax in free motion. The paper is itself not submerged in the wax. The excess wax is removed from both surfaces of the paper. The wax is cooled before it is absorbed by the paper. E. W. Labombarde, Nashua, N. H. United States Patent No. 1,681,350.

Papermaking Machine

THE papermaking machine, which is patented by A. Bellemare, Three Rivers, Canada, in United States Patent No. 1,680,277, is featured by the combination of a dryer roll with



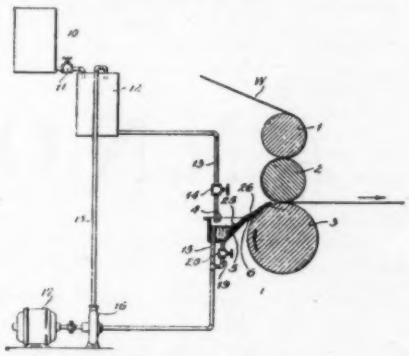
a grooved periphery, a rope which is adapted to run in this groove. Means are adapted to receive this rope when it becomes displaced from the groove.

Deinking Paper

UNITED STATES Patent No. 1,680,949 is concerned with a process for removing ink from paper, or rather from fibrous pulp. This consists in soaking the latter in an alkaline solution in the presence of a sulphonic acid compound. Then the pulp is washed with water without the use of superadded soap or fatty acid. A. R. Lukens, Wyoming, O., assignor, The Richardson Co., Cincinnati, O.

Striping Paper

THE accompanying illustration shows a striping attachment for papermaking machines. This attachment is shown at (25) and is adapted to co-operate with a pair of plain faced web-finishing rollers (2) and (3) of the machine. This attachment consists of a color trough (4) which has a lip (6) arranged adjacent and at a tangent to the periphery of the lowermost of the pair of rollers (1) and (2). A number of wick strands (26) each having an intermediate



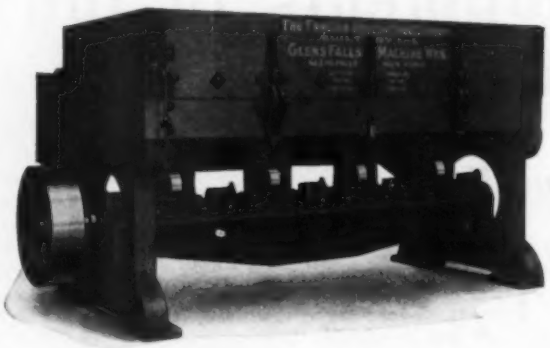
portion which is supported by the lip (6) of the trough are also provided. The other end of these strands rest upon the periphery of the roller (2) in such a manner that they are straightened by the drag of this roller. The arrangement is such that spaced lines of color will be applied to the roller by the wick strands to be immediately transferred to the paper web which passes between the pair of finishing rollers. E. B. Weston, Dayton, O. and W. G. Clark, Terre Haute, Ind., assignors, The Weston Paper and Mfg. Co. United States Patent No. 1,680,711.

Horizontal Centrifugal Screen

THE screening of stock in machines of this character is often faulty due to the dilution of the stock before it passes through the screen and not within the screen itself. This difficulty is overcome in the new type of screen which is shown in the accompanying illustration.

The mixture of stock and water enters the screen through the wooden trough (H) and pours through the elbow (K^1) into the annular shaped distributing conduit (R^1) which runs around the circumference of the machine. Thus this mixture of pulp and water gradually reaches the perforated jacket which surrounds the stock distributing box (S). The water which is used for diluting the stock (fresh water or white water may be used for this purpose) is fed into the screen through the conduit (A) and is introduced with the aid of the elbow (K^2) into the annular distributing trough (R^2) which also runs around the machine. From that point on the water of dilution is furnished in continuously regular amounts through the opening (B) into the diluting water distributing member (V).

The stock and water and diluting water distributing pockets are arranged one alongside the other. Both the stock and the dilution water is adjusted under the influence of the centrifugal force which is brought about by the rotation of the flywheel in the distributing channels (R^1) and (R^2) and in the pockets (S) and (V) parallel to the axis of screen-



The

FANCHER

Patented

ROLLER SHOE FLAT SCREEN

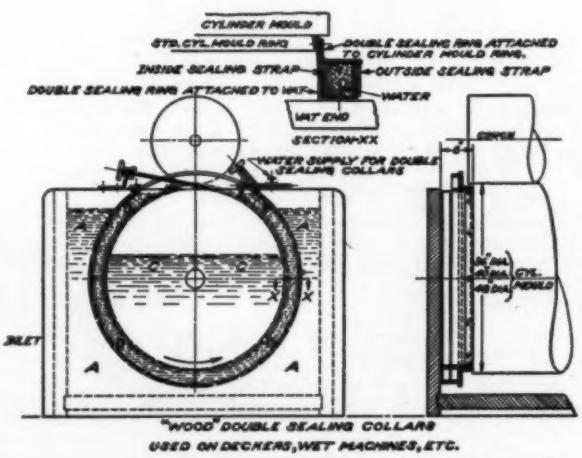
ANNOUNCING

The

A. D. WOOD

DOUBLE SEALING COLLAR

(Patent Applied For)



"WOOD" DOUBLE SEALING COLLARS
USED ON DECKERS, WET MACHINES, ETC.

GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

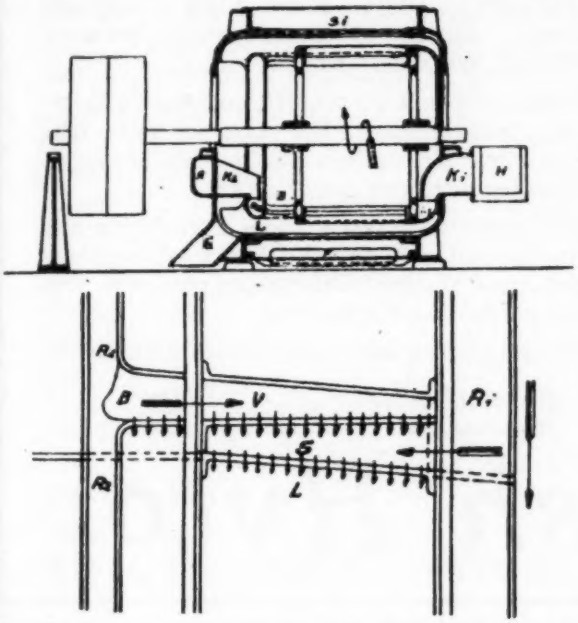
Waterous Ltd., Brantford, Ont. Manufacturing Agent

E. K. Mansfield Co., 501 Fifth Ave., N. Y. C.
Eastern Representative

Western Representative
Woodbury & Wheeler Co., 55 Second St.,
Portland, Ore.

See pages 342 and 343 in the 1927 Paper and Pulp Mill Catalogue

ing. Inasmuch as the dilution water pocket (V) lies somewhat nearer to the axis of screen than the stock pocket (S), hence the first is arranged over the second, hence the incoming water of dilution pours over the overflow edge into the stock pocket (S). The stock mixture whirls upwards and washes the fine fibres away from the coarser fibres and dilutes the same in order to facilitate the screening action. The mixture, flowing over the overflow edge, is strongly centrifuged against the perforated screen (S'). The useful fibres are carried along by the water through

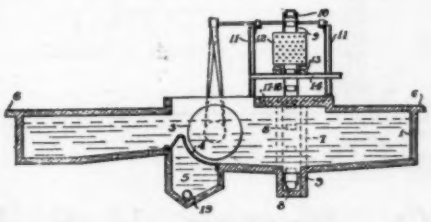


the holes of the screen and are thus led through the fine stock trough (F) to the dehydrating machine. The screened coarse stock is removed towards the coarse stock outlet (G) by means of distributing baffles (L) which are arranged at an angle to the screen. Before the coarse stock reaches the outlet (G), it is mixed with water which passes over the wire (B) and is thus thoroughly washed.

Thus a thorough separation of fine from coarse particles takes place in this new type of screen, and inasmuch as this ensues right in the stock water mixture, screening is facilitated to a considerable degree and the output as well as the effectiveness of the apparatus are materially increased. This, of course, refers to the recovery of the fine fibres. The coarse fibres, that is the refined stock, is no longer mixed with fine fibres, and all the more so for the reason that this stock is well washed after screening. O. Herdey, Bautzen and P. Rohland, Dreiwerden, Saare, Germany. German Patent No. 459,724.

Making Paper Pulp

THE illustration shows a pulp reduction apparatus. This is a combination of a stock beater and a channel (3) which extends across the bottom to an adjacent wall of the



beater tub, and upwardly outside the wall. This trough acts to receive foreign materials separated by gravity from stock in process of reduction in the beater. A series of buckets (3) is provided for removing the accumulation of these impurities in the trough. H. D. Martindale, Middletown, Conn. United States Patent No. 1,680,912.

Chlorine and Alkali Sulphate from Alkali Chloride, Sulphur Trioxide and Air

IT HAS been found that the action of sulphur trioxide on common salt or also on calcium chloride can be used in a technical and commercial process for manufacturing chlorine, when the reaction is conducted in such a manner that the waste gases contain no sulphur dioxide in addition to chlorine. This is contrary to what takes place in the Deacon process. In order for this to be accomplished, it is necessary in the first place that the gas, which enters into a reaction with the chlorides, is as free as possible from sulphur dioxide, and, on the other hand, that the temperature and the apparatus are selected in such a manner that dissociation of the trioxide into dioxide and oxygen does not take place.

Such gases as are obtained by the decomposition of oleum, are suitable for this purpose. The temperature, at which sulphur trioxide can act on the alkali chlorides lies between 300 and 600 degrees C. The chosen temperature is, therefore, essentially dependent on the apparatus used. It is also possible to operate at lower temperatures, when the reaction takes place between common salt and sulphur trioxide. This is an exothermic reaction and is accelerated by suitable contact substances. It is inadvisable to operate at temperatures over 600 degrees C., for the reason melting of the entire mass takes place within a definite time in the case of common salt at a temperature of 620 degrees C., if approximately 65 per cent of same is converted into sulphate. This would then mean that the further progress of the reaction is entirely stopped. Zellstofffabrik Waldhof and Dr. E. Schmidt, Mannheim-Waldhof, Germany. German Patent No. 458,998.

Clarifying Waste Waters by a New Method

THE method that is used in clarifying waste waters depends to a large degree on the quantity of water that must be treated. Thus, for example, the filtering system cannot be employed in the pulp and paper mill, for the reason that the large amounts of waste waters collected in such a mill would make the process impracticable. In this

Figure 1

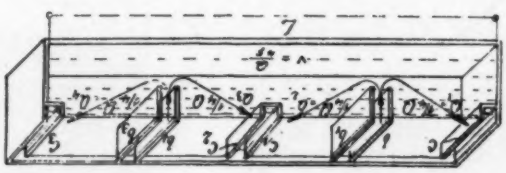
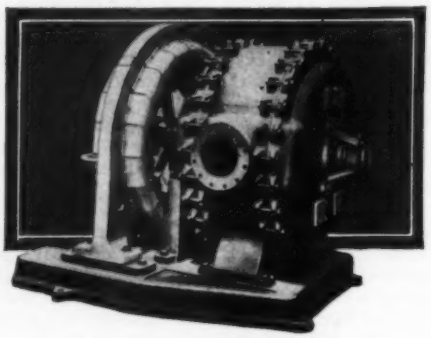


Figure 2

case, only settling processes can be successfully employed. All such processes employ a settling or clarifying chamber in which the fiber values sink to the bottom, and it is known that these chambers must be made very large in order to afford time for the paper fibres to separate out. The space occupied by such apparatus is a serious factor in determining their usefulness and economy. The following is, however, a description of an apparatus of this character whose space requirements are far less than usual.

Figure 1 shows a clarifying tank or vat with a settling chamber of the simplest possible kind. The waste waters are run in through an overflow gutter and the magnitude of the surface area is fixed to agree with a definite rate of flow of water through the box. The settling, therefore, takes

Direct drive instead of
noisy gears—slipping belts—costly chains



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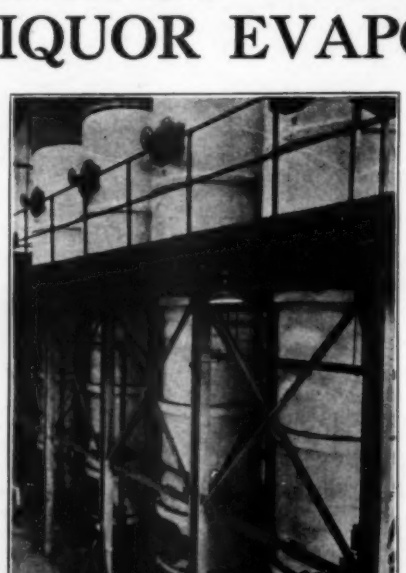

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MAXIMUM
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NO ENTRAINMENT

SODA and
SULPHATE
PROCESSES

E. B. BADGER & SONS CO., Boston, U. S. A.

See page 314 in the 1925 Paper and Pulp Mill Catalogue

place in a current of water throughout the entire length of the box, and it will accordingly set in, when the speed of flow is sufficient to allow the fibres to drop to the bottom of the apparatus. It is not necessary to go into a discussion of the disadvantages of such an apparatus.

When the construction of the box is changed as is indicated in Fig. 2, then the rate at which water can be put through it is materially increased. This is simply accomplished by the division of the flow of water into four separate streams. The baffles are seen at (b), (b1), (b2) and (b3) which divide the flow into three streams (Q1), (Q2), (Q3) and (Q4). These streams move through exactly the same surface area as the original stream (Q).

It is, therefore, evident that the basic thought in this settling process is increasing the production of the apparatus by

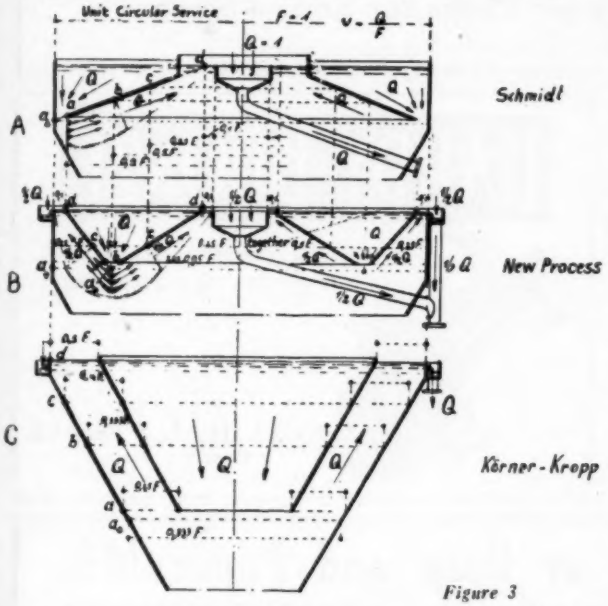


Figure 3

division of the flow. The theory then states that if the division of the flow is continued infinitely, then the speed of the flow will finally become equal to zero. There are, of course, practical limits beyond which it is not possible to go.

When this theory is applied to the common type of funnel separators, then a new design is developed as may be seen in Fig. 3. The division of the flow of waste water is accomplished by means of annular-shaped built-in funnels or annular guiding baffles, as well as by means of inner and outer annular overflow ridges. Figures 3A and 3C show older forms of save-alls, in which the waste water are simply allowed to flow into the apparatus with a gradually accelerated or de-accelerated flow from the inlet clear through the settling zone to the overflow. The numerals that are indicated in the various parts of figure show the relative speeds of flow and the magnitude of the settling surfaces based on units in apparatus with simple and double water flow through the apparatus. It is easy to see that the active separating zone is quite considerably increased by the division of the flow, and that the active clarifying zone is advantageously removed from the walls of the funnel. The rapidity of flow is also decreased in proportion with the division of the flow. However, the extent to which the flow of water through the apparatus is divided depends on the quantity of waste waters that are to be treated and on the size of the apparatus which is limited by this factor. A. H. Popp, Wochenblatt fuer Papierfabrikation, year 1928, pages 670 to 672.

Physical Behavior of Calcium Bisulphite Solutions

FOUR curves are drawn to show the manner in which the digestion liquor, which is used for the manufacture of sulphide pulp, behaves on heating. This information was sought for the purpose of using it to determine the manner in which the various processes take place within the digester, and also for the purpose of determining the possibility of preheating the digestion liquor. The digestion liquor is represented as a two phase system with three component parts, namely water, calcium bisulphite and sulphur dioxide. According to the Gibb's phase rule, there are three variables, namely, temperature, pressure and concentration. In carrying out the experiments to determine the reciprocal inter-relationship existing between these three variables, a liter of the solution is heated in an iron autoclave, which is furnished with a lead lining, an oil bath being used for the purpose. The liquor is maintained for a long time at temperatures which are constantly increased, in order that a definite pressure condition might be instituted. The pressures are controlled on cooling. The lower pressures are measured with the aid of mercury monometer and the higher pressure with the aid of a standardized monometer of common type, Dr. Malkomes, Technologie und Chemie der Papier und Zellstofffabrikaten, volume 25, pages 38 to 40.

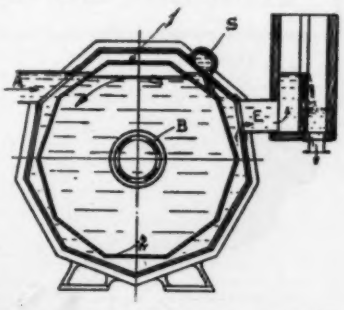
Washing Device for Parchmentizing Machines

THE paper web, which is to be washed, is carried over rollers between the spray tubes in the washing devices that have been used up to the present time on parchmentizing machines. Thus the roller must carry the web along. Hence it is easy to see that the paper web is used in part as a conveying belt. This results in a too high tension being induced in the paper web with the result that this web can be easily torn. Furthermore, the spray tubes or nozzles have ordinarily been arranged along the length of the paper web that is the loop which is formed between the lower and the upper rollers. Here again the paper web is subjected to very high tension due to the strong water pressure which is exerted by the nozzles in the effort thoroughly to wash the web. Hence, even the slightest imperfection in the paper or a very small tear in the edge is sufficient to tear the paper web clear through its width and interrupt the operation of the machine.

The new arrangement consists of automatically operated reels which are provided with spraying nozzles which are arranged over the circumference of the reel. These nozzles are arranged either on one or both sides of the reel over which the paper web is led. The paper web is washed in this fashion. It is claimed that the speed of travel of the paper web in this new arrangement of washing equipment on the parchmentizing allows the machine to be operated at a speed of approximately 300 feet per minute, without the paper web being injured in any way. P. Erkens, Duern, Rheinland, Germany. German Patent No. 457,089.

Pulp Screening Device

THE new apparatus, which is patented in German Patent No. 459,174, is distinguished from all others of similar nature in which the screening drum is arranged within an open tank, by the fact that the stationary drum is closed in. The result is that the rapid rotation of this drum will cause a vigorous circulation of the liquid in the annular space between it and the casing walls of the apparatus, and this rapid rotation and circulation can effect quickly changes in the pressure conditions within the apparatus.



This liquid will accordingly circulate through the annular channel with alternate increasing and decreasing cross-sectional area. Thus, this liquid will be alternately forced and sucked back again through the perforated walls of the drum. Hence, this not only makes possible the employment of a greater speed of rotation which produces a higher pressure, but also the total circumference of the drum is constantly

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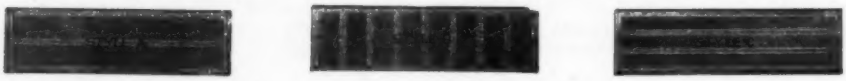

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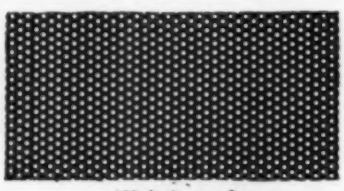
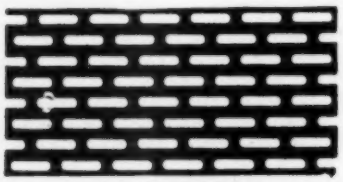
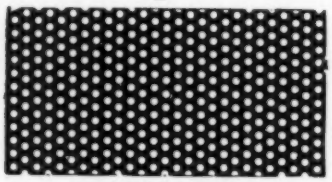


.065 inch round



⅜ x ⅝ inch Slots



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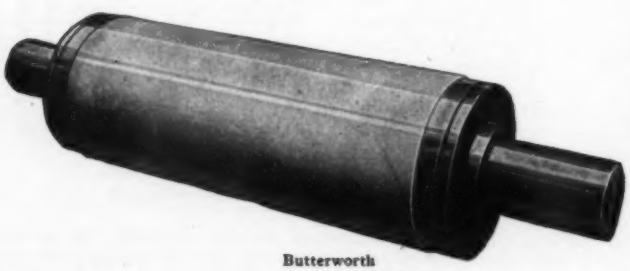

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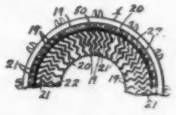
actively engaged in doing useful work. This, of course, increases the output of the machine. S. Thune, Skoeien, near Oslo, Norway.

Utilizing Black Liquor Formed in Soda Pulp Manufacture

THE liquor is subjected to pressure and heat in the usual process for the purpose of recovering valuable ingredients contained in it. The liquor is causticized, concentrated by evaporation, and the sodium acetate contained in it is crystallized out, while the mother liquor is again put through the process as so much white liquor. The treatment of the liquor for the recovery of sodium acetate is accomplished in such a fashion that the sodium acetate content remains constant in the white liquor. The dry residue is heated up for long a time before the fractional lixiviation that the residual organic substances that remain in the liquor after the acetate has been removed are decomposed either by carbonization or by volatilization. Erik Haegglund, Abo, Finland. Finnish Patent No. 11,861.

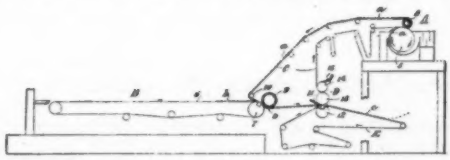
Jordan Engine

THE shell of the refining engine is provided with grinding bars which extend over the length of the shell. Other grinding bars are provided which are shorter than the shell and extend to one end of it, these bars being located between the longer bars. Filler blocks separate certain of the bars. The ends of the shorter bars (22) are acutely bevelled in the direction of the passage of the stock through the shell. H. R. Harrigan, Holyoke, Mass., assignor, E. D. Jones Sons Co. Pittsfield, Mass. United States Patent No. 1,681,935.



Making Multiply Paper

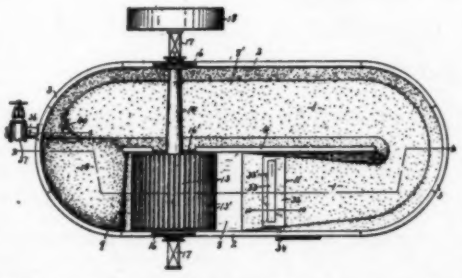
A NUMBER of wet webs of paper are formed and these webs are taken up by means of a pick-up felt. Then the felt is passed along with the webs superimposed on its



under side to and through a suction press in contact with a bottom wet felt. G. L. Bidwell, Riegelsville, Pa., assignor, The Warren Mfr. Co. United States Patent No. 1,682,826.

Beating Engine

THIS beater is characterized by possessing a special closure device for the shaft openings. This comprises a flexible diaphragm with a gland for receiving the shaft. J. D. Hask-



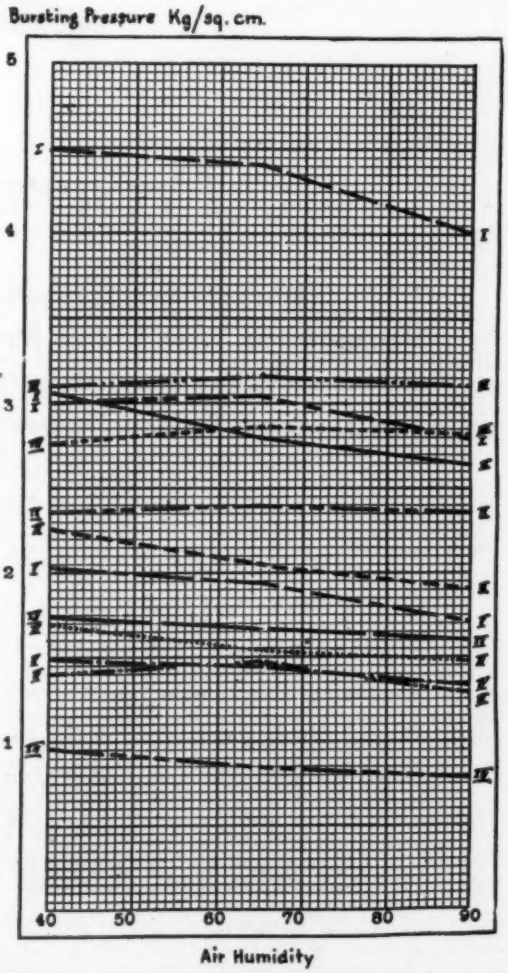
well, Fulton, N. Y., assignor, Dilts Machine Works Inc. United States Patent No. 1,683,546.

Humidity of Air on Bursting Strength of Paper

THIRTEEN different papers of different character and stock composition were tested at the Government Testing Laboratories in Berlin in a Mullen tester at 40, 65 and 90 per cent humidity, after they had been allowed to remain in such atmospheres for four days. The results which were obtained in these tests are given below in tabulated form.

No.	Test sample	Nature of stock	Average tearing length mm.	Average elongation	Bursting strength in kgs. per sq. cm. 50%	65% humidity	90%
I.	Normal 1	rags	5525	5.07	4.49 (102)	4.41 (100)	4.01 (91)
II	Normal 2a	rags	4425	4.2	3.06 (109)	2.80 (100)	2.64 (94)
III	Normal 3	50% rags-50% chemical pulp	4475	3.0	2.26 (110)	2.05 (100)	1.90 (93)
IV	Normal 4a	chemical pulp	3475	2.3	1.49 (103)	1.45 (100)	1.33 (92)
V	Wrapping paper 4a	50% chemical 50% mechanical	3350	2.4	2.04 (105)	1.94 (100)	1.72 (89)
VI	Writing paper 6a	60% mechanical 40% chemical	3550	1.4	1.40 (95)	1.47 (100)	1.30 (88)
VII	Bag paper	sulphite	6025	3.2	3.10 (98)	3.17 (100)	3.12 (98)
VIII	Bag paper	sulphite	5550	2.8	2.76 (97)	2.86 (100)	2.83 (99)
IX	Bag paper	soda pulp	6775	1.8	2.36 (99)	2.39 (100)	2.36 (99)
X	Bag paper	soda pulp	5425	4.5	3.00 (99)	3.04 (100)	2.80 (92)
XI	Parchment paper	chemical pulp	5250	2.7	1.69 (110)	1.53 (100)	1.47 (96)
XII	Parchment paper	chemical pulp	4150	1.6	1.73 (104)	1.67 (100)	1.60 (96)
XIII	Blotting paper	65% chemical -35% cotton	850	1.7	0.96 (113)	0.85 (100)	0.78 (92)

All the bursting strength figures are the average of ten



individual determinations in each individual case. Der Papierfabrikant, year 1928, pages 521 to 522.

Preserver of Ideas

In every age, man has felt the urge to record his experiences, his emotions, his transactions. When the Cave Man used a fire-pointed stick to scratch pictures into the formative stone of his cavern wall; when Marcus Aurelius transcribed his Meditations and Kong-fu-Tse his systems of ethics; when Defoe wrote his satires on civilization; and when the Tired Taxpayer takes his trusty portable typewriter in hand to write a letter to the Editor, this urge to express is one and the same.

We in this generation have convenient, cheap, and plentiful means of writing. Pens and pencils are in every pocket; typewriters in every office—almost every home. The reason? Paper, good and abundant: substantial enough for the records that will last a century or more, cheap enough to record a passing thought to be discarded on the morrow. The paper making machine has enabled the intangible idea to become reality.

HAMMERMILL PAPER COMPANY

Erie, Pennsylvania

New York, October 1, 1928,

THE customary broadening of activity in the paper industry in the fall of the year is beginning to be noted, and there are now spots in the market where business is considerably better than it has been for some time. Buyers are less hesitant about operating, and the number of orders is larger and purchasing is in bigger volume. At the same time, the market situation is not all that is desired by manufacturers and merchants—not by any means. The policy of hand-to-mouth buying is being practiced on all sides and in nearly every consuming quarter; users and converters of paper apparently are confident that they will not be called upon to pay any higher prices, nor that they will experience any trouble in covering any of their requirements even though their need of supplies should mount substantially, and consequently they are placing orders in a very guarded manner as wants develop.

There is, in fact, a good deal of complaint heard among paper producers and dealers over the present market situation. The basis of most of the remarks concerning the unfavorable condition is the lack of sufficient demand to keep all mills fully engaged in the production of paper and board. Of course, it is hardly to be expected that demand will ever reach that breadth where every paper and board mill in the country will have enough business flowing in to them to warrant maximum output, certainly not for a long time, because of the great expansion of productive facilities in the paper manufacturing industry in recent years, but present demand falls just far short enough to cause some mills to resort to price-cutting to a sufficient degree to make for an unsatisfactory as well as unprofitable market situation, and it is this which is the main reason for the complaint regarding the market.

Reports indicate that most paper mills in the U. S. are working at between 70 and 90 percent of capacity. A few are operating at full tilt or very close to maximum production, but they are the exceptions. As a class, the coarse paper mills appear to be busier than are the fine paper plants, reflecting a better all around demand for wrapping and other coarse grades than for the fine grades of paper. However, there has been a general increase in demand for practically all kinds of paper and board during the past month. With general business on the mend after the summer season, more paper is being consumed and therefore more is being bought, and the prospects for a further expansion of demand are considered bright. It is a recognized fact that a national election leads to a considerable increase in paper consumption, so that this added consumptive factor should in itself help business substantially, while the outlook for business otherwise is favorable. Manufacturers and merchants alike put stress on the small stocks of paper of all kinds which are being carried by consumers and distributors, and contend that this phase of the situation should keep buyers in evidence more or less all the time.

Production of paper in the United States declined rather sharply during July as compared with the preceding month, but this was a seasonal occurrence and therefore bears no particular significance. Mills of the country produced a total of 533,381 net tons of paper of all kinds in July, against 581,792 tons in June, according to the American Paper and Pulp Association, bringing the total output in the first seven months of this year up to 4,040,668 tons, contrasted with 3,925,229 tons in the similar time of 1927. Shipments from mills during July aggregated 539,713 tons, against 573,909 tons in the preceding month, while stocks at mills at the end of July were 291,468 tons, compared with 297,575 tons a month previously.

Newsprint paper output scored a sharp gain in August as compared with the preceding month. The total production in the United States and Canada was 316,596 tons in August, against 294,512 tons in July, while shipments from mills aggregated 311,433 tons for both countries, contrasted with 291,455 tons in July. Production in Canada was 200,656 tons in July and shipments 196,894 tons, while the United States production was 115,940 tons and shipments from mills 114,539 tons. The Canadian mills produced 206,109 tons more in the first eight months of 1928 than in 1927, which was an increase of 15 per cent. The United States mills made 76,436 tons, or 7 per cent, less than in the first eight months of 1927, while production in Newfoundland was 18,406 tons, or 14 per cent, greater, and in Mexico 1,082 tons more, making a total North American increase of 149,161 tons, or 6 per cent, over the first eight months of last year. During August the Canadian mills operated at 78 per cent of rated capacity and the U. S. mills at 77.4 per cent. Stocks of newsprint at Canadian mills totaled 52,108 tons at the end of August, and at United States mills 40,838 tons, making a combined total of 92,946 tons, which was equivalent to 6.2 days' average production.

The U. S. Department of Commerce's monthly statistical review of the paper board industry for August showed a sharp increase in board production in that month. There was, in fact, more board manufactured in the United States in August than in any previous month this year with the lone exception of May. The August output totaled 240,787 net tons, compared with 201,153 tons in July, 228,646 tons in June, and 242,394 tons in May, and brought the total for the first eight months of 1928 up to 1,777,147 tons, contrasted with 1,626,228 tons in the same period of 1927. Mills received new orders calling for a total of 240,064 tons of board in August, against 209,976 tons in July, and had unfilled orders on hand for 75,956 tons at the end of August, compared with 79,492 tons a month earlier. Shipments of board from mills during August aggregated 243,064 tons, compared with 203,741 tons in the preceding month, and stocks at mills at the end of August were 48,055 against 49,969 tons at the end of July. Board mills consumed a total of 219,012 tons of waste paper in August, compared with 190,810 tons in July, and had stocks amounting to 118,507 tons at the close of August, against 132,265 tons a month previously.

Reports to the Bureau of Labor Statistics of the U. S. Department of Labor in Washington from 221 paper and pulp mills gave their July employment at 58,150, compared with 58,430 in June, a decrease of 0.5 per cent. The payrolls in these plants also decreased from $1,539,876 in June to $1,498,929 in July, a decline of 4.5 per cent.

The usual seasonal increase in newsprint consumption is manifest in nearly all of the large cities of the country, and there is a firmer undertone in the print paper market. Wrapping paper is moving into consuming channels freely, and at maintained prices. Tissue is in fair demand though it is reported that something of a surplus of supply is now on the market and the price tone consequently is rather soft. Fine papers are in moderate call, and demand is showing gradual though slow expansion. Prices of practically all lines of writing, bond and ledger papers are well sustained. Book paper is in steady movement, especially on contracts, and most mills are said to have sufficient orders booked to keep them well engaged for the remainder of the year. Building papers are in less demand, since their season has about come to an end. Specialties of most kinds are moving steadily and at firm quotations. Boards are fairly active at maintained prices.

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Papermaking Rags

Aside from a slight change in roofing rags in a downward direction, the market for papermaking rags is very little altered from the situation last reported. Demand from paper mills is limited. Most consumers apparently are proceeding on the theory that there are plenty of rags to cover requirements at present, and that should their needs increase, they would be occasioned no great difficulty purchasing the additional supplies wanted, and most of the orders now placed are to cover actual and immediate requirements. Prices in a general way are holding their own, with dealers expressing confidence that no further recession will be seen in market levels, and contending that any expansion of mill demand would cause values to improve—especially as regards certain grades which, it is claimed, are not in plentiful supply by any means.

However, as matters shape up, it can be stated that such advantage as there is in the price situation as it now exists is with buyers. Doubtless purchasing agents of paper mills are succeeding in frequent instances in getting rags at concessions from the prices usually asked by sellers and which are recognized as constituting market levels. This market condition can be attributed in the main to the established fact that consumption of rags in the paper manufacturing industry has decreased to such a degree that dealers in various parts of the country are experiencing trouble locating an outlet for all the rags they have to sell, and consequently they are competing with one another in a manner that affects prices. Possibly the strongest factor in the situation at present, and has been for some while, is the firm markets prevailing for rags in Europe, where paper mills are consuming rag stock in larger volume and where a better sale is provided for rags and at more attractive prices than in the United States, with the result that fewer rags are available for export to America and very little pressure from abroad is felt in the market here. Were it not for this, there seems little doubt that market prices here would be beat down to still cheaper levels, nowithstanding the rather vehement complaint among dealers in this country that there is scarcely no profit to be realized in papermaking rags at the market values now obtaining.

Roofing paper mills mostly withdrew from the market as buyers early in September, and prices in due time eased, after having exhibited pronounced firmness for a considerable period. Latest reports state that No. 1 domestic roofing rags or cloth strippings are available at 1.75 cents per pound f.o.b. shipping points, and No. 2 domestic at 1.35 cents. Foreign dark colored cottons are quoted by importers at 1.70 cents a pound ex dock New York or other American Atlantic ports, but mills show little disposition to buy at this or even lower rates.

Some grades of new cuttings are marked by a little better demand, and prices have stiffened—sentimentally if not actually. New unbleached cuttings are firm at 10.50 to 10.75 cents per pound at dealers' shipping points, and light silesias are reported moving fairly well at 7.25 to 7.50 cents, blue overall cuttings at 6.75 to 7 cents, and bleached canton flannels at 9.25 to 9.50 cents. New No. 1 white shirt cuttings are more or less neglected by buyers and prices are around 10.25 cents a pound at shipping points. On the other hand, fancy shirt cuttings are reported in good demand and are fetching 5.50 to 5.75 cents per pound.

In old cottons, whites are quoted at 5.50 cents upward per pound at shipping points for No. 1 repacked, and 2.50 to 3 cents for No. 2 repacked. Thirds and blues are unchanged at around 2.25 cents a pound f.o.b. dealers' points for repacked, and 1.85 cents for miscellaneous packing. Foreign rags, both old and new, are in fair demand though the relatively high prices prevailing abroad serve to hold up business, and the current activity in the market cannot be described as anything more than normal, at best.

Average quotations f.o.b. shipping points and ex dock New York are as follows:

New Stock	New York and Chicago
White shirt cuttings, No. 1	10.00-10.50
White shirt cuttings, No. 2	6.00- 7.00
Fancy shirt cuttings	5.50- 5.75
Washables, No. 1	4.25- 4.50
Unbleached muslin	10.50-10.75
White lawns	9.00- 9.25
Overall cuttings, blue	6.75- 7.00
Black silesias	4.25- 4.50
Light flannelettes	7.75- 8.00
Canton flannels, bleached	9.25- 9.50
Canton flannels, unbleached	8.50- 8.75
Shoe cuttings, bleached	8.00- 8.25
Shoe cuttings, unbleached	6.25- 6.50
Light silesias	7.25- 7.50
O. D. khaki cuttings	5.50- 5.75
Mixed khaki cuttings	5.00- 5.25
Corduroy cuttings	3.25- 3.50
Cottonade cuttings	3.25- 3.50
Linens, No. 1, white foreign	13.00-14.00
Light prints foreign	2.75- 3.00
Old Stock—	
Whites, No. 1, repacked	5.50- 6.50
Whites, No. 2, repacked	2.50- 3.00
Whites, house soiled	2.00- 2.25
Whites, street soiled	1.85- 2.00
Lace curtains	5.50- 5.75
Thirds and blues, rough	1.75- 1.90
Thirds and blues, repacked	2.15- 2.35
Black stockings	4.10- 4.25
Cotton canvas, No. 1	4.75- 5.00
White cotton batting	3.50- 4.00
Roofing, No. 1 (cloth strippings)	1.75- 1.85
Roofing, No. 2	1.35- 1.45
Linsey, garments, foreign	1.85- 1.90
Dark colored cottons, foreign	1.70- 1.75
Blue linens, foreign	3.75- 4.00
Gray linens, foreign	4.00- 4.25
White linens, foreign	7.50- 8.00
Light prints, extra foreign	1.80- 2.00

Rope and Bagging

The demand for old rope from paper mills is keeping up in fair volume, and prices of this raw material are firm and inclining higher. There has been, in fact, some stiffening of market quotations in certain quarters, and dealers are putting a great deal of emphasis on the limited supplies of good-quality old rope that are being received from production sources. Domestic old No. 1 manila rope is selling at 3.75 cents a pound f.o.b. shipping points, and in excess of this price has been paid in some cases, while No. 1 foreign old manila is bringing 3.25 to 3.50 cents ex dock New York and other Atlantic ports. Strings are quiet and are quoted from 90 cents per hundred pounds upward at shipping points for mixed strings.

Paper mills have let down in their buying of old bagging, following a period of brisk activity during which roofing bagging moved in sizeable tonnage, especially for shipment from foreign sources. The price generally mentioned on No. 1 scrap bagging is 1.65 cents a pound at shipping points, while roofing bagging is selling at 1.25 to 1.30 cents.

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F.o.b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	1.60- 1.70
Gunny, No. 1 foreign	1.50- 1.60
Scrap bagging, No. 1	1.60- 1.70
Roofing bagging	1.25- 1.35
Wool tares, heavy	2.00- 2.25
Wool tares, light	1.75- 2.00
Manila rope, No. 1 foreign	3.25- 3.50
Manila rope, No. 1 domestic	3.75- 4.00
Sisal strings	1.50- 1.75
Mixed strings	.90- 1.10

Old Paper

The market for old paper is exhibiting much firmness, and prices of some grades not only are maintained fully on the higher levels established a month ago but have recorded further slight advancement. Mills are absorbing supplies freely, although objecting to paying any higher rates, and dealers assert that the supply situation is such as to help to make for a strong price tone.

In the New York market, about the strongest grade of stock is folded news, which has sold at 80 cents per pound f.o.b. that city, and which is reported in limited supply owing to fairly heavy foreign shipments of old newspapers and to the active buying by domestic mills. Shavings also have improved their price range a bit, and most dealers now ask at least 3 cents a pound for No. 1 hard white and 2.40 cents for soft white shavings f.o.b. shipping points. Extra quality packing has sold at well above these figures. Old kraft paper is bringing 2 cents per pound at dealers' points, and ledger stock is firm on a range of 1.50 to 1.80 cents per pound, depending on the packing. Old No. 1 mixed paper is selling in the East at 55 to 60 cents per hundred pounds f.o.b. New York, and at above these prices in the Middle West.

The following are quotations named by dealers f.o.b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	2.90- 3.15
Hard white shavings, No. 2	2.65- 2.90
Soft white shavings	2.35- 2.60
Colored shavings	1.00- 1.25
Heavy book, No. 1	1.35- 1.50
Crumpled book, No. 1	1.15- 1.25
Ledger stock	1.50- 1.80
Kraft, No. 1	1.90- 2.10
New kraft cuttings	2.50- 2.75
Manilas, No. 1	.90- 1.00
White blank news	1.65- 1.75
Overissue news, No. 1	.80- .90
Folded news	.75- .85
Sulphite mill wrappings	.80- .90
Old corrugated boxes	.70- .80
New corrugated box cuttings	.85- .95
Mixed paper, No. 1	.55- .65
Common paper	.40- .50

Pulpwood

Very little fresh activity is reported in pulpwood. The marketing season is over, and sellers and buyers alike are biding their time and seldom attempting to negotiate business. So far as is learned, quoted prices are maintained though they are mainly nominal under present market circumstances.

Exports of pulpwood from Canada in August, 1928, all of which came to the United States, amounted to 178,970 cords, valued at $1,854,224, compared with 186,383 cords of a value of $1,991,884 exported in the preceding month, and 180,416 cords of a value of $1,924,730 in the corresponding month last year.

Mechanical Pulp

The market for mechanical wood pulp continues quiet. Occasional reports are received of an expansion in demand in this or that quarter, but the increased market activity most often is shortlived, and it can be stated that in a

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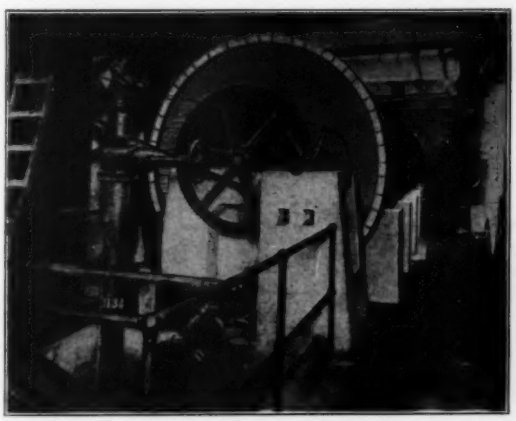

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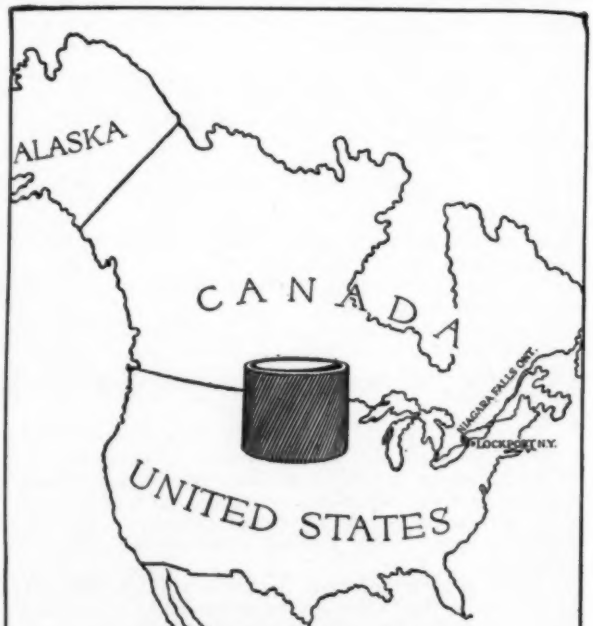

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general sense the situation is anything but to the liking of producers and sellers of ground wood and that numerous grinders have become so discouraged over the market condition that they have curtailed their production of pulp rather drastically. Prices are altogether in favor of buyers, who in a majority cases are securing the supplies required at concessions from the rates quoted by sellers, despite the fact that manufacturers declare there is no profit whatever to be realized in ground wood at prevailing market levels.

Canadian producers are asking $25 per ton f.o.b. pulp mills for prime spruce mechanical pulp, but purchases are being made well under this price, down to $21 being mentioned in some instances. Domestic ground wood is around a price basis of $25 to $26 a ton f.o.b. pulp mills, while imported pulp of Scandinavian origin is quoted at $31 to $32 per short ton ex dock New York or other American Atlantic ports.

Production of ground wood in the United States in July last amounted to 72,667 net tons, showing a decrease from the 87,235 tons produced in the preceding month, according to the American Paper and Pulp Association. Mill stocks at the end of July totaled 110,596 tons, compared with 120,043 tons a month earlier.

Chemical Pulp

The softening of quotations on imported pulps is having its influence on domestic pulp, yet no definite changes of consequence are reported in prices of the latter. Demand from consuming quarters is fair though buyers are operating carefully, mostly confining their purchases to directly needed commitments. Doubtless in certain instances sales are being made at slight recessions in price in order to compete with the foreign product, and it can be said also that the greater part of the pulp now moving from domestic mills into consuming channels is against contracts—open market activity being rather restricted.

Bleached sulphite displays price firmness, and is quoted at 4 cents por pound upwards f.o.b. pulp mills for the most desirable brands, though some qualities are reported available down to 3.75 cents. Unbleached sulphite of book grade is quoted at 2.75 cents or higher, and of news quality at 2.50 cents upwards. Domestic No. 1 kraft pulp is around 2.80 or 2.85 cents a pound at pulp plants, and bleached soda pulp at 3 to 3.25 cents per pound.

Mills in the United States produced a total of 113,593 net tons of chemical pulp of all grades during July, 1928, contrasted with 122,575 tons produced in the preceding month, according to statistics compiled by the American Paper and Pulp Association. Stocks at mills on July 31 last were 24,722 net tons against 26,759 tons at the end of June.

Quotations f.o.b. pulp mills are as follows:

Bleached sulphite	3.75- 4.75
Easy bleaching sulphite	2.75- 3.00
Unbleached sulphite, No. 1 strong (news grade)	2.50- 2.75
Unbleached sulphite, No. 1 book	2.75- 3.00
Soda pulp, bleached	3.00- 3.25
Mitscherlich, unbleached	3.00- 3.25
Kraft, No. 1	2.75- 3.00
Screenings, refined	1.40- 1.60

Chemicals

The movement of pulp and papermaking chemicals against contracts is of fair scope, and market rates as a rule are holding steady to firm. Caustic soda is maintained quotably at 2.90 cents per pound at works for spot shipments, and soda ash is steady at 1.32½ cents a pound for the product packed in bags f.o.b. works. There has been a little easier price tone in casein, and quotations are from 16 to 17 cents a pound for the domestic and 16½ to 17 cents for the imported product.

Average quotations are as follows:

Alum, lump ammonia	3.50 - 3.75
Alum, lump starch	3.75 - 4.00
Blanc fixe, powder	3.50 - 3.75
Bleaching powder	2.00 - 2.35
Brimstone (long ton, at mine)	18.00 -20.00
Casein (duty aid)	16.00 -17.00
Caustic soda, spot delivery	2.90 - 3.00
China clay, domestic washed	8.00 -10.00

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For acid proof lining of digester.
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White rag	15-40
White sulphite	9-30
Colored rag	15-40
Colored sulphite	8-30
Ledger—	
White rag	16-40
White sulphite	9-30
Colored sulphite	8-30
Colored rag	15-40
Bonds—	
White rag	16-40
White sulphite	7-30
Colored sulphite	7-30
Colored rag	15-40
Books—	
No. 1 S. & S. C.	5.75- 8.00
Machine finished	5.50- 8.00
English finished	5.50- 8.00
Coated and enameled	8.00-14.00
Lithograph, M. F.	8.00-15.00
Newsprint—	
Rolls, contract	3.00- 3.25
Rolls, transient	3.25- 3.50
Sheets	3.50- 3.75
Side runs	2.90- 3.15
Cover stock—	
Coated, both sides	-10.25
Coated, one side	-10.15
Tissue—	
No. 1 white, 20x30	.75- .90
No. 2 white, 24x36	.75- .90
No. 1 Manila, 24x36	.70- .80
Kraft	.90- 1.00
Wrapping—	
No. 1 kraft	5.50- 6.00
No. 2 kraft	4.25- 4.75
Southern kraft	4.25- 4.50
Boards—	New York and Chicago
Solid news	45.00-50.00
Straw	52.50-57.50
Plain chip	40.00-42.50
White coated chip	50.00-55.00
Manila coated chip	50.00-55.00
Binder's board	65.00-70.00

Chemicals

(*Continued from page* 1293)

China clay, foreign	14.00 -20.00
Rosin, Grade E	9.65 - ....
Satin white	2.00 - 2.25
Soda ash, 50 per cent light (bags)	1.32½- ....
Starch, papermakers', in bags	4.07 - ....
Talc (ton)	16.00 -18.00

George C. Webber, assistant sales manager of the American Engineering Co., died at his home in Philadelphia, Pa., October 1. Mr. Webber, who was born in Milton, N. H., 37 years ago, had been associated with the American Engineering Co. and its predecessor, the American Ship Windlass Co., for more than 17 years. Although in poor health for several months past, he had recovered sufficiently to partially resume his duties.

Market Quotations

Issued by H. D. Knox & Co., 44 Broad St., New York

The quotations mentioned below are more or less nominal in some cases owing to the inactivity of the securities, but we invite inquiries on these and other allied industries' securities and we will endeavor to furnish actual markets.

Bonds	Bid	Asked
Abitibi Fibre Co. 6s, 1941	104	
Abitibi Power & Paper 5s, 1953	89¾	90½
Abitibi Power & Paper 6s, 1940	105	106
American Sales Book 6s, 1939	102½	104
Advance Bag & Paper 6s, 1952	99¼	100¼
Bastrop Pulp & Paper 6s, 1940	104½	
Beaver Products 7½s	109	111
Beaverboard 8s, 1933	102	103
Bedford Pulp & Paper 6s, 1942	98	100
Belgo Canadian Paper 6s, 1943	100	101
British Columbia Pulp & Paper 6s, 1950	88	91
Brompton Pulp & Paper 6s, 1935	103	
Brown Company 5½s, 1946	100	100¾
Brush Moore Paper 6½s, 1937	99¾	
Bryant Paper Co. 6s, 1942	100	101
Celotex Co. 6½s, 1939	99	101
Canada Paperboard Co. 7s, 1937	96½	98½
Central Paper Co. 6½s, 1941	87	89
Central Paper Co. 6s, 1933	87	89
Central Paper Co. 7s, 1932	88½	
Champion Fibre 6s, 1941	101	103
Champion Paper 6s, 1945	95	98
Champion Coated Paper 6s	102	
Columbia River Paper Mills 6s	98	
Defiance Paper Company 6s, 1939	98	100
Dells Paper & Pulp 6s, 1939	95	98
Donnacona Paper Co. 5½s, 1948	93	95
Eastern Manufacturing 7s, 1938	99½	100
Escanaba Paper Co. 6s, 1939	98	100
Escanaba Paper Co. 5s, 1928	98	101
Filer Fibre 7s, 1937	93	
Fort William Paper Co. 6s, 1946	101	102
Fitchburg Paper Co. 5s, 1929	99	
Glatfelter Paper 6s, 1938	94	96
Hawley Pulp & Paper Co. 6s, 1946	100	
Hoberg Paper & Fiber 7s, 1937	94½	96
Industrial Fibre 8s	100	102
Itasca Paper Company 6s	99	
Itasca Paper & Prairie River 5½s	100	
Jessup & Moore Paper Co. 6s, 1945	75	82
Kalamazoo Vegetable Parchment 6s, 1938	99	101
Manitoba Paper Co. 6½s	103	105
Mead Fibre Co. 7s, 1937	100	
Munising Paper Co. 6s, 1936	98	
Marathon Paper Mills 5½s, 1942	99	
Marinette & Menominee Paper Co. 7½s	101	103
Mead Pulp & Paper Co. 5s	95½	
Mengal Co. 7s, 1934	103	105
Mengal Co. 7s, 1933	101	
Minnesota & Ontario Paper Co. 6s	96	98
Missisquoi Pulp & Paper Co. 7s, 1929	99	
Missisquoi Pulp Paper Co. 6s, 1945	98	
Monroe Paper Products 7½s	97	99
Murray Bay Paper Company 6½s	103	
Oswego Falls Paper Co. 6s, 1941	98	100
Orono Pulp & Paper 6s, 1943	102	
Orono Pulp & Paper 6s, 1941	97	
Parker Young Co. 6½s, 1944	99	101
Paper & Textile Machinery 7s	100	103
Paterson Parchment Paper 6s, 1938	101	102½
Peerless Paper Co. 6s	98	100
Penobscot Chemical Fibre Co. 6s, 1942	102	104
Queen City Paper Co. 7s	97½	
Riordan Pulp & Paper 6s, 1942	102	
River Raisin Paper 6s, 1936	98	101
Rolland Paper 6s, 1937	99	101
St. Regis Paper 6½s, 1931	99	101
St. Regis Paper 6s, 1931	100	101
St. Annes Paper 6½s, 1953	103	105
St. Croix Paper Co. 5s, 1928	99	
St. Helena Pulp & Paper 6s, 1941	99	
St. Lawrence Pulp & Lumber Co. 6s	5	7
Spruce Falls Power & Paper 5½s	98	100
Stevens & Thompson Paper 6s, 1942	95	97
Southern Advance Bag & Paper 6s, 1947	93	94
Smith (Howard) Paper 6½s, 1941	103	
Smith (Howard) Paper 5½s, 1953	95	98
Taggart Bros. 6s, 1941	95	100
Tait Paper & Color Industries 6s	88	90
Ticonderoga Pulp & Paper 6s, 1940	100	102
Ticonderoga Pulp & Paper 5s, 1930	95	98
Tonawanda Paper Company 5½s	99	101

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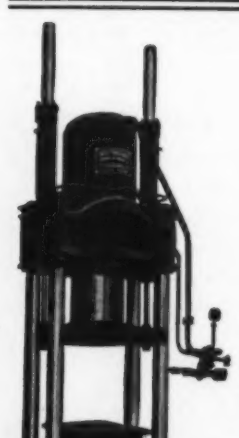

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EXPORTS

Exports of paper from the United States during July, 1928, were somewhat smaller in point of total value than in the preceding month, but showed an increase over the corresponding month last year, according to official statistics compiled and issued by the U. S. Department of Commerce in Washington. Exports of paper of all kinds and to all places in July last were valued at $2,519,856, compared with shipments of a value of $2,825,946 in June this year, and $2,200,290 in July a year ago. Total exportations of paper in the first seven months of the current year aggregated in value $17,794,951, showing a fair rate of gain over the exports valued at $16,069,199 in the similar period of 1927.

Newsprint paper shipments from the United States in July amounted to 2,481,461 pounds, valued at $96,605, against 1,732,735 pounds of a value of $59,689 exported in the preceding month, and 1,966,603 pounds of a value of $92,691 in July, 1927. Exports of book paper, uncoated, increased substantially in July over a year ago, totaling 2,046,978 pounds of a value of $146,168, contrasted with 1,694,369 pounds of a value of $139,507 shipped abroad in the same month last year. Wrapping paper exports in July were more than double the quantity exported in the similar month of 1927, the figures being 3,099,773 pounds, valued at $225,398, this year, against 1,258,010 pounds of a value of $166,593 in July a year ago. Exports of writing paper also climbed from a total of 996,794 pounds of a value of $136,944 in July, 1927, to 1,828,259 pounds of a value of $201,642 in the same month this year.

Exports of box board from the U. S. were valued at $128,516 in July last, showing a marked increase over last year when shipments were valued at $85,771, while exports of other paper board and strawboard totaled in value $175,105, against $135,494 in July, 1927.

IMPORTS

Wood Pulp

It is quite apparent that a majority of paper board manufacturers in the United States are proceeding slowly in contracting for supplies of wood pulp for forward shipment from abroad next year. There are some who have engaged in buying on a fair scale, particularly of certain lines of pulp which they are accustomed to using, but thus far this season purchases for spring shipment from Europe have not approached the tonnage usually noted at this period of the year because of the waiting policy adopted by many consumers. It appears as if there is a well-defined feeling among papermakers that they will be able to buy foreign pulp for 1929 shipment from abroad at lower prices than now obtain, which already are a bit below the market levels which ruled during most of the current year. Emphasis is put on the increased production of pulp in Scandinavia, owing to the starting of new mills, and on the improbability of any labor difficulty developing in the pulp industry of Norway and Sweden, such as was the case early this year which led to a rather heavy curtailment of the year's output of pulp in Sweden. At any rate, buyers in the United States are of the belief that pulp values will go no higher, and that everything is in their favor of getting the supplies needed at a further recession in cost, so it is this that is prompting many of them to hold off purchasing for the new year.

Meantime, market prices are showing little additional change from the slightly lower levels established recently. There are some producing mills in Scandinavia which are eager for orders and which doubtless are shading prices in some cases as an added attraction to customers, but in a general sense, quoted rates are maintained. Bleached sulphite displays a particularly firm undertone, and it is reported that 3.90 cents a pound ex dock American Atlantic ports is about the lowest price at which strictly prime bleached sulphite can be bought, with some mill brands held for 4 cents and higher. Strong unbleached sulphite of prime grade is quoted at 2.65 cents and thereabouts for current shipment from abroad ex dock New York, whereas forward shipments are to be had, it is stated, down to 2.55 cents and perhaps a shade less. Prime standard Swedish kraft pulp is around a price basis of 2.60 to 2.65 cents ex dock New York for current shipment from abroad, and 2.50 to 2.60 cents for next year's shipment. Prime easy bleaching sulphite is quoted at 2.85 to 3.05 cents, according to quality, and ordinary unbleached Mitscherlich sulphite around 2.65 cents. Imported ground wood is on a quotational level of $31 to $32 per short ton ex dock U. S. Atlantic ports.

Imports of wood pulp into the United States were large in July, totaling 116,623 long tons of chemical pulps of a value of $6,769,684, compared with 110,017 tons of a value of $6,388,867 imported in the preceding month, and 105,148 tons of a value of $6,586,808 in July a year ago. The July imports were larger than in any previous month this year excepting January and February, and brought the total for the first seven months of 1928 up to 711,538 tons of chemical pulp, giving a monthly average of 101,648 tons, against a monthly average of 98,159 tons in the corresponding period of last year. Ground wood imports in July amounted to 12,994 tons, valued at $309,428, contrasted with 18,329 tons of a value of $430,728 in the preceding month, and for the first seven months of this year were 124,402 long tons, valued at $3,039,341, against 110,839 tons of a value of $3,228,798 in the similar time of 1927.

Current market quotations ex dock New York, and receipts at the port of New York during September, 1928, follow:

Bleached sulphite, No. 1	3.85	4.25
Unbleached sulphite, strong No. 1	2.60	2.80
Unbleached sulphite, No. 2	2.40	2.60
Easy bleaching sulphite	2.85	3.05
Mitscherlich unbleached, genuine	3.00	3.25
Mitscherlich unbleached, ordinary	2.60	2.75
Kraft, standard Swedish	2.55	2.75
Ground wood, per ton (dry)	31.00	32.00

J. Anderson & Co., 2,660 bls. from Greaker, 50 Oslo, 125 Soderhamn and 7,050 Hernosand; O. E. Kiaer, 1,125 bls. from Greaker; Johaneson, Wales & Sparre, 299 bls. from Gothenburg, 275 Sundsvall and 135 Bremen; E. M. Sergeant Co., 499 bls. from Gothenburg; Scandinavian Pulp Agency, 3,048 bls. from Gothenburg, 275 Sundsvall and 125 Skutskar; Atterbury Bros., 1,750 bls. from Oslo; Castle & Overton, 544 bls. from Rotterdam, 150 Sundsvall and 2,695 Hamburg; M. Gottesman & Co., 2,400 bls. from Sebenico, 1,500 Iggesund and 650 Rotterdam; Price & Pierce, 500 bls. from Gothenburg and 600 Wallock; Perkins-Goodwin Co., 8,400 bls. from Obbola and 3 Sundsvall; Bulkley, Dunton & Co., 625 bls. from Gefle, 3,400 Iggesund, 5,140 Soderhamn and 1,685 Stugsund; Pagel, Horton & Co., 500 bls. from Gefle and 1,854 Hernosand; Chemical National Bank, 1,191 bls. from Iggesund, 254 Hamburg and 3,600 Oslo; Chase National Bank, 1,400 bls. from Oslo; Acer & Co., 6,961 bls. from Chandler, Can.; E. J. Keller Co., 1,224 bls. from Hamburg; Central National Bank, 600 bls. from Sundsvall; Order, 1,000 bls. from Oslo, 335 Hamburg, 6,450 Hernosand, 2,377 Kotka and 1,249 Raumo.

Paper Stock

Importations of rags for papermaking into the United States during the first seven months of 1928 totaled 249,552,745 pounds, valued at $4,601,961, compared with 220,233,105 pounds of a value of $4,606,682 imported in the similar time of 1927, according to official statistics issued by the

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U. S. Department of Commerce. Imports of waste bagging and waste paper in the same period were 87,851,815 pounds, against 51,602,599 pounds last year, and of old rope and other paper stock 35,715,600 pounds, against 38,563,270 pounds in 1927.

Imports of papermaking materials in September, 1928, were fair, judging from arrivals through the port of New York. There were some fair-sized shipments of rags received, and normal quantities of old rope, bagging and miscellaneous paper stock came in at that port last month.

Arrivals of all grades of paper stock excepting wood pulp at the port of New York in September, 1928, these data being taken from manifests of steamers reaching that port during the month, were as follows:

Old Rope—William Steck & Co., 44 rolls and 142 coils; E. J. Keller Co., 403 bls.; United Fruit Co., 3 bls.; American Exchange Irving Trust Co., 220 bls. and 111 coils; Brown Bros. & Co., 969 coils and 195 bls.; Furness, Withy & Co., 108 bls.; Anglo-South American Trust Co., 77 coils; Ellerman's Wilson Line, 157 coils; Banca Commerciale Italiana Trust Co., 211 bls.; J. C. Van Itallie, 4 bls.; Order, 177 bls. and 196 coils.

Old Bagging—Castle & Overton, 319 bls.; George W. Millar & Co., 324 bls.; Guaranty Trust Co., 300 bls.; James Rosenberg, 157 bls.; E. Butterworth & Co., 87 bls.; Interstate Trust Co., 70 bls.; Darmstadt, Scott & Courtney, 234 bls.; Bank of the Manhattan Co., 84 bls.; Chemical National Bank, 129 bls.; W. Schall & Co., 289 bls.; E. J. Keller Co., 746 bls.; C. B. Richard & Co., 39 bls.; Order, 451 bls.

Rags—Darmstadt, Scott & Courtney, 202 bls.; Castle & Overton, 1,222 bls.; American Wool Stock Co., 2 bls.; E. Mayer, 528 bls.; International By-Products Co., 16 bls.; J. Cohen & Sons Co., 61 bls.; W. Lowenthal & Co., 16 bls.; Atlas Waste Mfg. Co., 60 bls.; J. Reiss Co., 6 bls.; E. Butterworth & Co., 30 bls.; Paul Berlowitz, 179 bls.; Victor Galaup, Inc., 211 bls.; Overton & Co., 218 bls.; E. A. Stone Co., 11 bls.; Jaffe Products Co., 41 bls.; Bank of the United States, 23 bls.; Rowe & Co., 12 bls.; E. J. Keller Co., 717 bls.; Robert Blank, 92 bls.; Trade Representative of U. S. S. R., 90 bls.; State Bank, 10 bls.; Manufacturers Trust Co., 64 bls.; National City Bank, 118 bls.; Equitable Trust Co., 151 bls.; Bank of the Manhattan Co., 625 bls.; Guaranty Trust Co., 468 bls.; Bank of New York & Trust Co., 183 bls.; Banca Commerciale Italiana Trust Co., 36 bls.; Chase National Bank, 1,764 bls.; Interstate Trust Co., 172 bls.; Philadelphia National Bank, 83 bls.; First Trust Co. of Albany, 31 bls.; Union Trust Co. of Philadelphia, 168 bls.; Fidelity Trust Co., 148 bls.; Chemical National Bank, 78 bls.; American Exchange Irving Trust Co., 128 bls.; G. P. Lotterhand, Inc., 6 bls.; American Oversea Corp., 62 bls.; Porto Rican Express Co., 114 bls.; Advance Import Co., 10 bls.; C. B. Richard & Co., 449 bls.; Barrett Co., 524 bls.; A. W. Fenton, Inc., 678 bls.; U. S. Forwarding Co., 18 bls.; C. R. Spence & Co., 626 bls.; International Sanitary Rag Co., 126 bls.; Order, 1,185 bls.

Miscellaneous Paper Stock—Alexander H. Searle, Inc., 156 bls.; Castle & Overton, 523 bls.; Darmstadt, Scott & Courtney, 630 bls.; General Fiber Co., 78 bls.; Salomon Bros. & Co., 78 bls.; Victor Galaup, Inc., 190 bls.; Star Woolen Co., 45 bls.; E. Butterworth & Co., 269 bls.; James Rosenberg, 157 bls.; S. Birkenstein & Sons, 284 bls.; Sterling Paper Mill Supply Co., 111 bls.; Jaffe Products Co., 58 bls.; Daniel M. Hicks, Inc., 6 bls.; William Steck & Co., 50 bls.; George W. Millar & Co., 149 bls.; E. J. Keller Co., 798 bls.; Union Bank & Trust Co., 474 bls.; Chase National Bank, 896 bls.; Chemical National Bank, 442 bls.; Bank of United States & Trust Co., 69 bls.; Philadelphia National Bank, 46 bls.; Bank of the Manhattan Co., 675 bls.; National City Bank, 56 bls.; Guaranty Trust Co., 62 bls.; Equitable Trust Co., 83 bls.; Bank of New York & Trust Co., 50 bls.; Henry W. Peabody & Co., 127 bls.; R. F. Downing & Co., 39 bls.; W. Schall & Co., 99 bls.; Amtorg Trading Co., 15 bls.; C. R. Spence & Co., 101 bls.; Richard Shipping Co., 131 bls.; Kidder Peabody Acceptance Corp., 324 bls.; N. V. Exp. Com. Hdls. My., 158 bls.; Van Oppen & Co., 136 bls.; A. W. Fenton, Inc., 114 bls.; T. D. Downing & Co., 122 bls.; Brown Bros. & Co., 241 bls.; Milton Snedeker Corp., 239 bls.; C. B. Richard & Co., 707 bls.; Goldman, Sachs & Co., 134 bls.; Order, 1,483 bls.

Paper

Imports of paper into the United States last July showed an increase in point of value over the receipts in the preceding month and were also larger than in the similar month a year ago, amounting to an aggregate of $12,649,377 for all grades of finished paper, against $12,035,580 in June of this year, and $12,067,168 in July last year, according to official U. S. Department of Commerce figures. Imports in the first seven months of the current year were valued at $88,594,331, compared with $83,670,183 in the corresponding period of 1927.

Paper imports during September, 1928, were fairly heavy, judging from receipts at the port of New York. Arrivals of all kinds of paper through that port last month, these data being taken from manifests of steamers reaching New York during the month, were as follows:

Printing—Perkins-Goodwin Co., 1,421 reels from Bremen and 49 reels Hamburg; Ossian Ray, 149 reels from Gothenburg; B. F. Drakenfeld & Co., 149 cs. from Liverpool; J. J. Bernitz, 65 bls. from Hamburg; Walker Goulard Plehn Co., 8 bls. from Rotterdam, 186 bls. Bremen and 25 bls. Hamburg; F. Henjes, Inc.,

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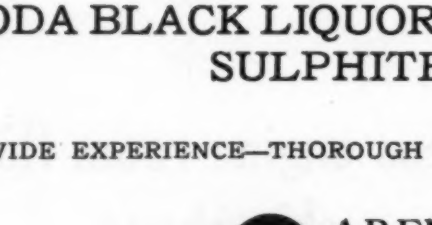

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129 reels from Hamburg; E. Dietzgen & Co., 76 cs. from Rotterdam and 13 cs. Hamburg; S. Blenfang, 23 cs. from Bremen; Hudson Trading Co., 98 rolls from Sundsvall; Journal of Commerce, 144 reels from Bremen; W. J. Byrnes & Co., 100 cs. from Havre; Guaranty Trust Co., 199 rolls from Oslo; Bank of Montreal, 6,186 rolls from Cornerbrook; International Paper Co., 315 rolls from Cornerbrook; Keuffel & Esser Co., 32 rolls from Hamburg; P. C. Zuhlke, 20 cs. from Antwerp; National City Bank, 139 bls. from Hamburg; C. A. Redden, 6 bls. from Southampton; Oxford University Press, 4 cs. from Liverpool; Martin & Bechtold, 13 cs. from Bremen; A. S. Zabriskie, Inc., 80 reels from Bremen; H. Reeve Angel & Co., 12 reels from Bremen; Order, 3,921 rolls and 149 bls. from Bremen and 534 reels from Norrkoeping.

Wrapping—Crepe Kraft Co., 92 reels and 9 bls. from Gothenburg; Birn & Wachenheim, 10 bls. from Hamburg and 111 cs. Antwerp; Wilkinson Bros. & Co., 35 cs. from Gothenburg; Blauvelt Wiley Paper Mfg. Co., 256 cs. from Gothenburg; J. H. Schroeder Banking Corp., 76 cs. from Hamburg; W. J. Honan, 6 bls. from Bremen; Calhoun, Robbins & Co., 2 cs. from Hamburg; Steffen, Jones & Co., 7 cs. from Antwerp; D. S. Walton & Co., 412 rolls and 34 bls. from Gothenburg; C. K. MacAlpine & Co., 196 reels and 192 bls. from Gothenburg; Thomas-Barrett & Son, 28 bls. from Gothenburg; J. Beckhard & Co., 92 cs. from Bremen; Arkell Safety Bag Co., 647 reels from Gothenburg; Union Paper and Twine Co., 107 bls. and 125 reels from Gothenburg; Borregaard Co., 170 bls. from Gothenburg; S. E. Vernon & Co., 80 bls. from Gothenburg; T. D. Downing & Co., 50 bls. from Antwerp; Universal Carloading & Distributing Co., 26 cs. from Bremen; Order, 12 cs. from Antwerp.

Cigarette—Standard Products Corp., 310 cs. from Havre; P. J. Schweitzer, Inc., 128 cs. from Marseilles and 26 cs. Havre; De-Mandult Paper Corp., 324 cs. from Havre; Surbrug Co., 20 cs. from Havre; Southern Pacific Co., 3 cs. from Havre; Cjasta Corp., 2 cs. from Kobe; British-American Tobacco Co., 3 cs. from Havre and 181 cs. Southampton; American Tobacco Co., 400 cs. from Bordeaux; M. Spiegel & Sons, 8 cs. from Bordeaux; Liggett & Myers Tobacco Co., 5 cs. from Bordeaux.

Writing—J. E. Bernard & Co., 3 cs. from Havre and 17 cs. Southampton; Guibont Freres & Co., 17 cs. from Havre; Distinctive Writing Paper Co., 4 cs. from Havre; B. Altman & Co., 8 cs. from Southampton; Eleto Co., 16 cs. from Hamburg; P. L. Kraemer & Co., 3 cs. from London; C. Bruning, 25 cs. from Marseilles.

Drawing—Keuffel & Esser Co., 3 cs. from London and 18 cs. Rotterdam.

Filter—H. Reeve Angel & Co., 6 cs. from London and 212 bls. Southampton; A. Giese & Son, 59 bls. from Southampton and 2 cs. Hamburg; J. Manheimer, 116 bls. from Southampton; E. Fougera & Co., 52 cs. from Southampton; Happel & McAvoy, 16 cs. from Rotterdam; Blackman & Blackman, 12 bls. from Bordeaux.

Tissue—J. H. Thorpe & Co., 2 cs. from Havre; F. B. Vandegrift & Co., 3 cs. from Liverpool; Schenkers, Inc., 208 cs. from Hamburg; Order, 12 cs. from Hamburg and 4 bls. Bremen.

Hanging—A. C. Dodman, Jr., Inc., 14 bls. from Liverpool and 6 bls. Southampton; C. A. Haynes & Co., 28 pkgs. from London, 39 pkgs. Southampton and 51 bls. Liverpool; F. J. Emmerich & Co., 16 cs. from Hamburg, 6 bls. Liverpool and 3 bls. London; Schmidt, Pritchard & Co., 2 bls. from Hamburg; American Exchange Irving Trust Co., 48 cs. from Hamburg; Stern, Stiner & Co., 3 cs. from Hamburg; F. A. Binder, 5 bls. from Bremen; Premier Flong Co., 60 cs. from Hamburg.

Photo—P. C. Zuhlke, 216 cs. from Antwerp and 13 cs. Rotterdam; Gevaert Co. of America, 100 cs. from Antwerp; J. H. Schroeder Banking Corp., 185 cs. from Bremen; Globe Shipping Co., 369 cs. from Bremen and 59 cs. Rotterdam; Keuffel & Esser Co., 55 cs. from Hamburg; J. J. Gavin & Co., 5 cs. from Liverpool; American Express Co., 52 cs. from Antwerp; Order, 127 cs. from Hamburg.

Board—Adrian Vuyck, 380 reels from Rotterdam; Wilkinson Bros. & Co., 51 rolls from Gothenburg; G. Eigner, 3 cs. from Hamburg; C. H. Powell & Co., 174 reels from Rotterdam; Lagerloef Trading Co., 257 bls. from Bremen and 139 bls. from Hamburg; Coty, Inc., 94 cs. from Havre; C. K. MacAlpine & Co., 7 bls. from Gothenburg; J. A. Raber, 8 bls. from Gothenburg; Perkins-Goodwin Co., 392 rolls from Rotterdam; American Express Co., 125 cs. from Hamburg; F. Bing, Inc., 50 bls. from Bremen; Grand Corrugated Paper Co., 314 reels from Rotterdam; Hygrade Eagle Corrugated Paper Products Co., 208 reels from Rotterdam; Haas Bros., 214 reels from Rotterdam; Walker Goulard Plehn Co., 270 rolls from Rotterdam; D'Orsay Perfumery Co., 39 cs. from Havre.

Miscellaneous—D. C. Andrews & Co., 5 cs. from Hamburg; Japan Paper Co., 14 cs. from Havre and 8 cs. Gothenburg; Overton & Co., 2 cs. from Hamburg; International Souvenir Corp., 20 cs. from Marseilles; A. W. Fenton, Inc., 3 cs. from Havre; S. Gilbert, 53 cs. from Bremen; J. J. Shore & Co., 16 cs. from Bremen; P. Murray Hill, Inc., 22 cs. from Bremen; Schoeller, Hoesch, Schmid Corp., 10 cs. from Rotterdam; E. M. Sergeant Co., 14 cs. from Gothenburg; G. W. Sheldon & Co., 2 cs. from London and 8 cs. Southampton; E. Dietzgen & Co., 40 cs. from Hamburg and 5 cs. Rotterdam; Central Union Trust Co., 49 cs. from Hamburg; L. Greenberg & Son, 7 cs. from Hamburg; Heemsoth, Basse & Co., 9 bls. from Rotterdam; F. C. Strype, 4 cs. from Rotterdam and 3 cs. Antwerp; J. Henschel & Co., 9 cs. from Hamburg; Bertram Blake Paper Co., 5 cs. from London; Borden & Riley Paper Co., 2 cs. from Antwerp; Brown Bros. & Co., 27 cs. from Hamburg; A. Goodman & Co., 6 cs. from Havre; Quality Art Novelty Co., 28 cs. from Hamburg; American Hawaiian S. S. Co., 17 cs. from Havre; Coenca-Morrison Co., 13 cs. from Havre; P. H. Petry & Co., 6 cs. from Rotterdam, 5 cs. Hamburg and 3 cs. Bremen; Schoeller & Hirsch, 25 cs. from Rotterdam; C. Steiner, 31 cs. from Rotterdam; Burroughs, Wellcome & Co., 16 cs. from London; Van Oppen & Co., 3 cs. from Hamburg and 3 cs. Bristol; H. D. Catty & Co., 4 cs. from Havre; Judson Freight Forwarding Co., 52 cs. from Antwerp and 76 cs. Bremen; International Forwarding Co., 53 cs. from Rotterdam, 42 cs. Hamburg and 8 cs. Antwerp; Globe Shipping Co., 189 cs. from Rotterdam, 6 bls. Hamburg and 14 cs. Havre; R. F. Downing & Co., 10 cs. from Havre, 3 bls. Hamburg and 23 cs. Bremen; Richard Shipping Co., 4 cs. from Bremen; American Express Co., 20 bls. from Hamburg; Freedman & Slater, 3 cs. from Hamburg;

TRADE MARK

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HIGHEST QUALITY

SPECIALLY MADE FOR THE PAPER TRADE

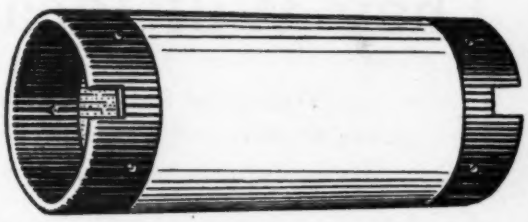
PRICES ON APPLICATION

BEMIS ASSOCIATES INC.

WATERTOWN, MASS.

ELIXMAN PAPER CORE CO., INC.

Corinth, N. Y. U. S. A.



Canadian Elixman Co., Ltd., Hamilton, Ontario

Ham Feltz says:

"It's been my observin' that the fellow what's been at the game a long time seems to know how to talk a machine into busting up production records with the kind of paper what pleases the boss. I reckon that's the same reason why these Hamilton Felts get rid of so much water—the same men've been makin' 'em for 70 years. It's a case of knowing how."

Hamilton Felts

KNOW THE BEST FROM THE REST

KNOW

Our Product Is the Best.

Proved by Test from Coast to Coast

Stowe & Woodward Company

Newton Upper Falls, Mass. *The Rubber Roll Makers*

PRESS FELTS for BOARD MACHINES

USE OUR PRESS FELTS

and Improve Your Product

THE WATERBURY FELT COMPANY

SKANEATELES FALLS, N. Y.

Felts and Jackets—That Serve and Satisfy

They Will Please You

Your quest for satisfactory wires will be over when you give our High Quality Fourdriniers a trial. This statement is made without reservation or equivocation.

Our wires are infinitely better in every respect, today, than ever before. More Mills than ever are securing from them a maximum of service and a minimum of trouble. We have every reason to believe they will run satisfactorily on your machines. **Will you give them a trial?**

Our wire cloth, Cylinder Moulds and Dandy Rolls bear the hall mark of Cheney Bigelow Quality.

CHENEY BIGELOW WIRE WORKS

Established 1842 **Springfield, Mass.**

Thomas & Pilerson, 3 cs. from London; J. E. Bernard & Co., 3 cs. from Havre; American Exchange Irving Trust Co., 10 cs. from Havre; J. Beckhard & Co., 78 cs. from Rotterdam and 26 cs. Bremen; Whiting-Patterson Co., 29 cs. from Rotterdam and 26 cs. Southampton; Hensel, Bruckman & Lorbacher, 17 cs. from Rotterdam and 55 cs. Bremen; Perry, Ryer & Co., 3 cs. from Southampton; Meadows, Wye & Co., 18 cs. from Rotterdam; Arnhold & Co., 25 cs. from Hong Kong; J. H. & G. B. Siebold, 25 cs. from Hong Kong; Kupfer Bros. Co., 29 cs. from Bremen; L. Mendell, 24 bls. from Havre; Whitfield Paper Works, 66 cs. from Kobe; Keller-Dorian Paper Co., 42 cs. from Havre; Satisfaction Supply Co., 5 pkgs. from Havre; Tamm & Co., 2 cs. from Havre; Robert Wilson Paper Corp., 8 rolls from Glasgow; F. Henjes, Inc., 16 bls. from Bremen.

Market Quotations

(*Continued from page* 1295)

United Wall Paper Co. 6s, 1947	96	98
Watab Paper 6½s, 1942	102	104
Whitaker Paper Co. 7s, 1938	108¼	109½
Warren (S. D.) 6s, 1945	104	105
Westfield River Paper Co. 7s	88	90
Whitmer (Wm.) Sons—Parsons Pulp & Lumber 8s	22	25
Waterway Paper Products 6s, 1931	101	
STOCKS		
American Book Common	130	140
American Sales Book Common	83	84
American Sales Book Pfd.	111	112½
Androscoggin Pulp Co. Common	30	
Androscoggin Pulp Co. Pfd.	90	
Brown Company Pfd.	95	97
Bryant Paper Co. Common	7	10
Belgo Canadian Paper Co. Pfd.	104	106
British Columbia Pulp & Paper Common	7	9
British Columbia Pulp & Paper Pfd.	70	
Canada Paperboard Co. Pfd.	90	94
Champion Fibre Co. Pfd.	107	
Champion Coated Paper Pfd.	105	107
Chemical Paper Co. 1st Pfd.	90	
De Jonge (Louis) Pfd.	95½	96½
Dryden Paper Co. Pfd.	42	44
Diem & Wing Preferred	92	95
Downington Paper Co. Pfd.	103	
Downington Paper Co. Common	93	
Eddy Paper Co. Common	30	
Escanaba Paper Co. "B" Pfd.	42	
Escanaba Paper Co. Common	3	
Glatfelter Paper Co. Common	101	
Great Northern Paper Co. Common	81	
Gair (Robt.) Preferred	40	43
Gair (Robt.) Common	10	13
Hawley Paper Co. Pfd.	96	
Hammermill Paper Co. Pfd.	109	110½
Holyoke Card & Paper Co. Pfd.	170	
Hinde & Dausch Paper Co. Pfd	101	103
Hinde & Dausch Paper Co. Common	190	
International Pulp Pfd.	75	
International Textile Co.	18	22
Jessup & Moore Paper Co. Pfd. (1st)	27	31
Jessup & Moore Paper Co. Common	9	10
Keyes Fibre Co. Common	43	45
Marathon Paper Mills Common	125	
Marathon Paper Mills Pfd.	170	
Mead Pulp & Paper Common	68	72
Minnesota & Ontario Paper Co. Pfd.	70	75
Missisquoi Pulp & Paper Pfd.	90	95
Munising Paper Co. Common	22	25
Munising Paper Co. Pfd.	83	87
Northern Paper Mills	28	32
National Paper & Type Pfd.	77	83
Orono Pulp & Paper Common	40	45
Oglesby Paper Co. Pfd.	101	
Occident Paper Co. Pfd.		15
Oxford Paper Co. Pfd.	109½	
Oxford Paper Co. Common	195	205
Parker Young Co. Pfd.	89	92
Parker Young Co. Common	25	
Penobscot Chemical Fibre Common	80	
Package Paper & Supply Units	22	
Robertson Paper Co. Pfd.	5	
River Raisin Paper Co.	8	10
Robertson Paper Co. Common	50c	
Rogers Paper Co. Common	45	50
St. Regis Paper Co. Pfd.	105	106
St. Croix Paper Co. Common	168	
Southerland Paper Co. Common	24	28
Tait Paper & Color Industries Pfd.		90
Tait Paper & Color Industries Common		70
United Wall Paper Co. Pfd.	90	95
United Paperboard Co. Pfd.	63	67
West Virginia Pulp & Paper Pfd.	101	103½
West Virginia Pulp & Paper Common	51	53
West Virginia Timber Co. Pfd.	90	94
Westfield River Paper Co. Pfd.	85	95

The salesmen of the Lincoln Electric Co., Cleveland, Ohio, came from all parts of the United States and Canada to attend a two-day convention held in the companies research laboratories. The wide range of application of the electronic tornado principle to automatic arc welding was demonstrated at the meeting.

There can be only one Answer

(And you know what it is)

"THE acceptance of Dayton High Speed equipment in more than 70 mills leaves no room for doubt regarding the kind of a beating job Daytons do.

It's up to us to find out right now what Daytons can do for us."

The Dayton Beater & Hoist Co., Dayton, Ohio

E. K. Mansfield Co.,
501 5th Ave., New York, N. Y.

DAYTON HIGH SPEED BEATERS

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

L. H. BREYFOGLE, Kalamazoo, Mich. INTERNATIONAL TRADING CO., Philadelphia, Pa.

PACIFIC SALES COMPANY, Security Bldg., Portland, Ore.

National Safety Council
168 East Ohio Street,
Chicago, Illinois.

Please send me without obligation, information on how I can reduce accidents in my organization.

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Street .....

State .....

Your Name .....

You, too, can reduce *Your* ACCIDENTS

OVER 4,300 American companies have reduced their accidents even as much as 90 percent through the services of the National Safety Council—the only non-profit national accident prevention organization for industry. This accident prevention service, developed by foremost safety engineers, is complete. It has saved Council members millions of dollars. At a low price, you too can get the assistance in Safety work that your company needs.

You, as a member of the National Safety Council, will receive each month a selection of forty two-color accident prevention posters—strikingly illustrated. This is a definitely planned program to educate your workmen in Safe Practices—to reduce your accident costs. A sample poster in miniature is shown at left.

The National Safety News, an eighty-page magazine, will be sent to you each month. You will find its articles practical—inspiring—of real service.

In addition, you will be privileged to call upon the Council's staff of trained Safety engineers, editors, and librarians for information and advice on your accident prevention problems. At your disposal is the Council Library—the most comprehensive collection of safety knowledge in existence.

Investigate the services of the National Safety Council—only partly covered in the foregoing paragraphs. Kimberly Clark, Long Bell Lumber Company, and hundreds of other small and large companies use it profitably. Why not you? Return the coupon for full information.

Foreign Trade Opportunities

The following foreign trade opportunities are issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. Those interested are requested to communicate with the Bureau at its offices in Washington or New York or its branch offices in other cities, in every case mentioning the number of the inquiries referred to.

No. 33143—Machinery for making paper bottles. Sao Paulo, Brazil. Purchase desired.

No. 33043—Overissued newspapers. Tientsin, China. Agency desired.

No. 33071—Soda ash. Toronto, Canada. Purchase and agency desired.

No. 33063—Rosin. Hamburg, Germany. Purchase and agency desired.

No. 33276—Aluminum-coated sulphite, kraft and newsprint papers. Havana, Cuba. Agency desired.

No. 33213—Box-making paper machinery. Sao Paulo, Brazil. Purchase desired.

No. 33230—Sheet paper, and writing paper and note books. Santos, Brazil. Purchase desired.

No. 33202—Rosin. Helsingfors, Finland. Agency desired.

No. 33261—Caustic soda. Riga, Latvia. Agency desired.

No. 33354—Cardboard, pasted, black on one side and white on the other, for composition books. San Juan, Porto Rico. Purchase desired.

No. 33357—Newspaper, old. Cairo, Egypt. Agency desired.

No. 33361—Cardboard (corrugated) manufacturing machinery. Sao Paulo, Brazil. Purchase desired.

No. 33393—Printing, bookbinding and lithographic paper, machinery and supplies. Sydney, Australia. Exclusive agency desired.

No. 33401—Tape, blank, gummed. Kitchener, Canada. Purchase and agency desired.

No. 33377—Caustic soda and soda ash. Hamburg, Germany. Purchase desired.

Appointments by Swenson Evaporator

The Swenson Evaporator Co., a subsidiary of Whiting Corp., Harvey, Ill., well-known manufacturers of evaporators, continuous crystallizers and special chemical equipment, has appointed H. D. Grant as chief engineer. Mr. Grant is a graduate of the University of Michigan, and since 1921 has been engaged in chemical engineering, especially the design and operation of heat transfer equipment.

Another interesting appointment by this company is that of K. A. Forrest, formerly superintendent of the Camas, Wash. mill of the Crown-Willamette Paper Co., to the position of manager of the pulp and paper mill equipment division. Mr. Forrest will be located at the main office in Harvey, where he will direct his efforts toward the design and development of mount equipment and other apparatus pertaining to pulp mill operations. He is a graduate engineer, and has had considerable experience along engineering lines in connection with the designing and operation of sulphate pulp mills.

Chain Companies Combine

Announcement has just been made that subject to the approval of stockholders, the Union Chain & Mfg. Co., Sandusky, Ohio, will acquire control of the American High Speed Chain Co., Indianapolis, Ind.

The Union Chain & Mfg. Co. builds elevator and conveying machinery, together with a complete line of steel sprocket chain for such purposes. The American High Speed Chain Co. is engaged in the manufacture of a complete line of silent high speed chains and smaller pitch steel roller chain together with the necessary sprockets, all of which are used primarily for power transmission purposes.

When the plan is approved by the stockholders, the machinery and equipment of the American High Speed Chain Co. will be moved to Sandusky, a new unit having been provided to permit the proper installation of such equipment.

Thousands Upon Thousands Are In Daily Use

Such preference could only be built on a foundation of excellence and merit.

Bronze
Double Disc Gate Valve
150 lb. W. S. P.

Bronze
Wedge Disc Gate Valve
200-300 lb. W. S. P.

LUNKENHEIMER
BRONZE GATE VALVES

are being relied upon in thousands of plants—in practically every industry—to economically control the flow of steam, liquids, oil and gas.

The Double Disc type has a simple and practical ball and socket bearing between the discs which makes them self-adjusting and provides the greatest degree of flexibility in seating engagement.

The Wedge Disc type has a single disc, double seated. Seat rings are renewable in sizes 1 inch and larger.

Discs in all patterns are accurately guided by ribs cast integral with body. Stuffing boxes are repackable under pressure with valves wide open.

Lunkenheimer Distributors, with complete stocks are located in all industrial centers. They will fill your requirements promptly.

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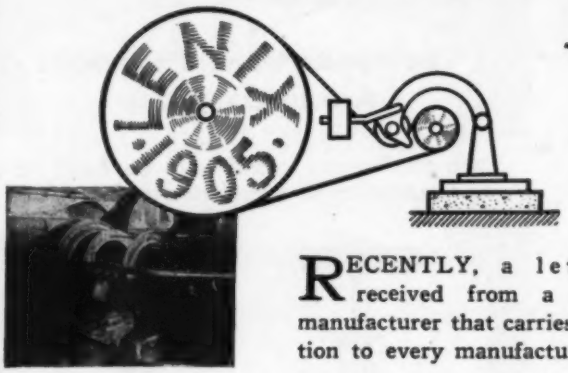
THE LENIX DRIVE



Double headed motor driving two beaters by means of the LENIX Drive.

—Starts new belt driven units out right

—Corrects trouble on existing units

RECENTLY, a letter was received from a prominent manufacturer that carries a suggestion to every manufacturer.

In this man's plant, the LENIX Short Center Belt Drives on the beaters and pumps:

". . . increase the horsepower considerably, prolong the life of the belting and make for a much smoother drive."

So, consider the LENIX Drive for the belt driven equipment in your plant. Consider it for the new equipment you are planning to install.

You will save in operating, maintenance and building costs. Send in the details for our recommendations.

F. L. SMIDTH & CO.
Incorporated 1895 Engineers
225 Broadway, New York City

The **LENIX** *Drive*
(Trademark Reg.)

Specialists in Steel Plate Fabrication

You will find Biggs as well qualified to meet your requirements for tanks, pipe, penstocks, flumes, stacks and other heavy steel plate as for Rotaries and Digesters. Perhaps you would like

Miscellaneous Assortment of Biggs Welded and Riveted Steel Tanks.

to know how Biggs facilities and standards of accuracy can serve you. We'll gladly send you our interesting folder "What Biggs Does and How," promptly on request.

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STEEL PLATE WORK